FEBRUARY 1955

chemical processing

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Putman Publishing Company

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CO_2 "TRAPS" IN NH_3 PLANT
"Waste" gas then becomes dry ice in Brea Chemical's controlled-fill presses.
See page 16.

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For Your Development Programs:

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Important new additions to Baker & Adamson's extensive line of reagents and research chemicals are the Rare Earths. Increasingly, these special reagents are finding applications in new experimental techniques, and for product development programs in many fields.

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SETTING THE PACE IN CHEMICAL PURITY SINCE 1882

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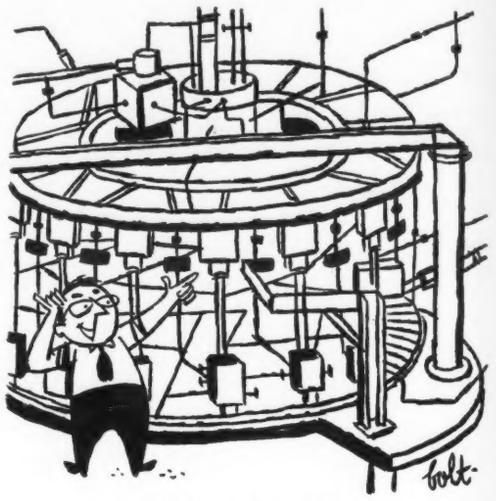
THAT'S INTERESTING



"All this . . . for nothing!!"

Much ado about . . . vacuum

A rotary "un-filling" machine is being produced at Consolidated Vacuum Corp., Rochester, N.Y. The unit is designed to evacuate and seal radio and electronic tubes at rates up to 2000 per hour. Not only will the machine speed production of tubes, but it will also create "higher low pressure" inside them.

Useful photographic film is corrosion resistant

Photosensitive, anodized aluminum sheets, designed for photographic reproduction using standard darkroom techniques, are finding use in making wiring diagrams, instrument and slide rule scales, and other products. Complete rights to make and sell the corrosion-resistant sheets, known as Metalphoto (and developed originally by Horizons, Inc. of Cleveland), are held by Metalphoto Corp., Dept. CP, 2903 E. 79th St., Cleveland 3, Ohio.

Dry powder aerosols make appearance

Wide potential is indicated for push-button dispensing of dry powders from pressurized aerosol containers. Among the first of these products is a zinc stearate mold release for use in the plastics industry. Propellent, Freon, is a product of Du Pont. Mold release agent is manufactured by Injection Molders Supply Co., Dept. CP, 3514 Lee Rd., Cleveland 20, Ohio . . . or for more information check CP 4885 on handy form opposite last page.

(*Continued on page* 227)

chemical processing

(CHEMICAL PROCESSING PREVIEW)

for men who manage

Vol. 18 February, 1955 No. 2

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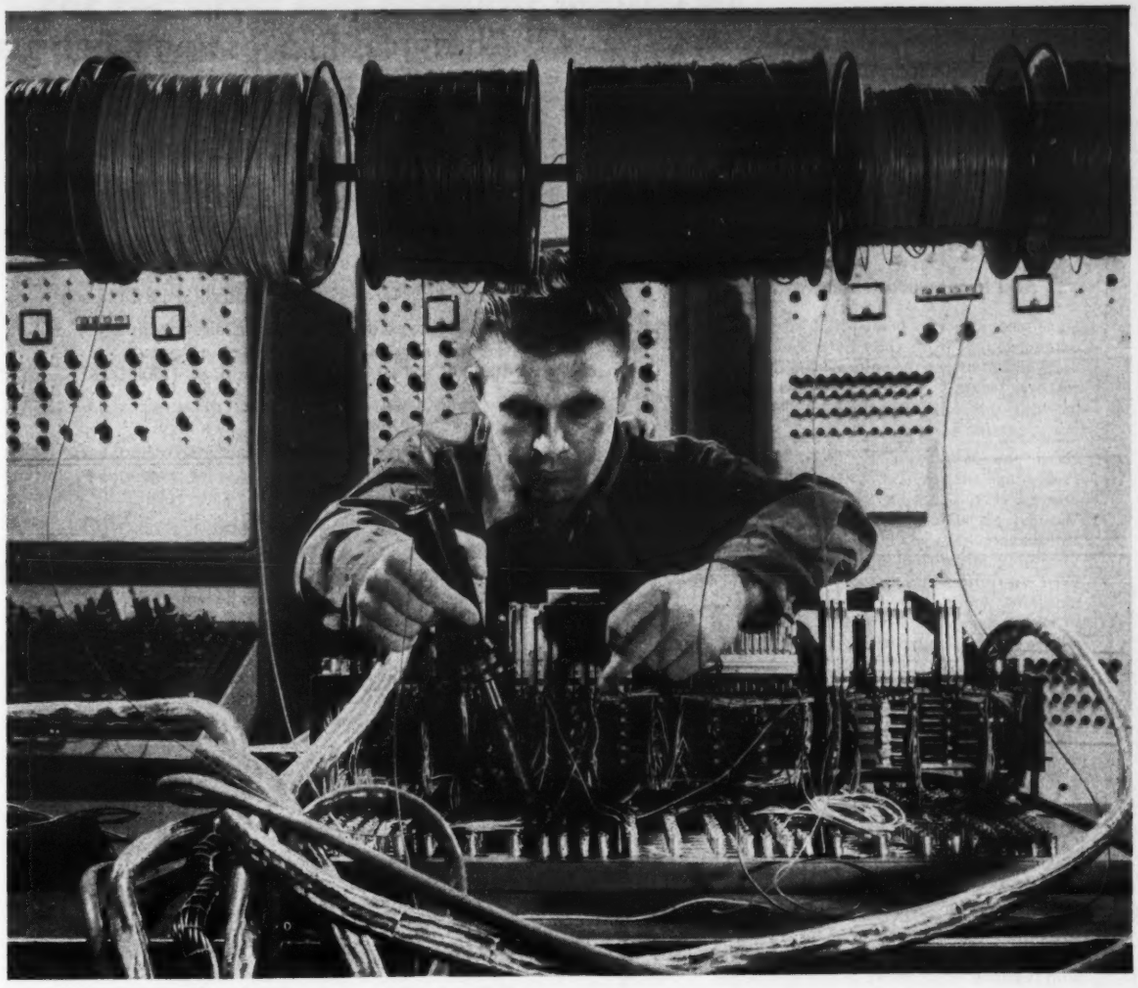
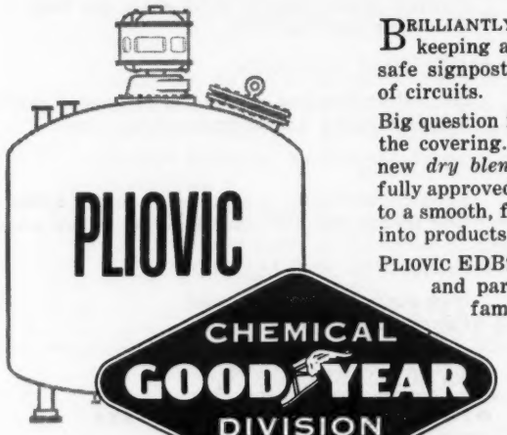


How to keep an electronic mind thinking straight



BRILLIANTLY jacketed wires are the answer to the problem of keeping an analog computer thinking straight. They serve as safe signposts that guide technicians quickly through the maze of circuits.

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Over the editor's shoulder

. . . and it comes out here

Some people resent being called nosey. We editors delight in it. Only by poking around are we able to get the information our readers are seeking. There's a direct relation between our snooping and the value of our magazine to you.

Have you ever wondered how Chemical Processing stories get into print? The process is too flexible to be generalized. We may get a tip from a friend or business acquaintance. We've been known to spot something interesting in a newspaper story. Even an office bull session may turn up something to be looked into. Trade shows, society meetings, and product releases may all furnish the tip we look for.

Once a potential story has been spotted, letters go out to people we think may know something about it. In many cases these are old friends of ours who had a hand in designing or selling the system employed. More often we turn to people in the plant.

The penalty of being nosey — a polite turn-down — is often the next step in this process . . . because most of our stories deal with competitive processing know-how. But in many cases we do get invited to witness performance of a new process.

It's inside the plant that we usually have best luck developing stories. By talking with various department heads and supervisors, we get the material from the man who's best able to provide the in-use information we're trying to uncover. What Company A takes for granted often turns out to be a revelation to Company B.

The easiest part of writing a story is the actual writing. Getting the real facts is what's hard . . . and what counts.

R J Callahan

ASSISTANT EDITOR

THIS MONTH'S COVER

Near Los Angeles, Brea Chemicals, Inc., makes 235 tons/day of ammonia from air and natural gas. In absorption column, right front, MEA solution removes carbon dioxide from H_2-CO_2 mixture leaving gas reform furnaces. Caustic scrubbers, rear, remove last traces of carbon dioxide from both hydrogen and incoming air. Air is processed further to obtain pure nitrogen which combines with hydrogen to make ammonia. Carbon dioxide is compressed and cooled to yield dry ice (see page 16). Brea, subsidiary of Union Oil Company of California, markets agricultural ammonia as aqua ammonia fertilizer solution. (Photo courtesy C. F. Braun & Co.)

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2. If you are looking for information on specific products, use the Product Directory "Quick-locator" for all types of materials, instruments, processing equipment, etc. This Product Directory lists everything in this issue, with page references 217

3. If you want to subscribe to this magazine, see reader-qualification form opposite last page

Feb. 8-10. The Society of the Plastics Industry, Inc., 10th Annual Reinforced Plastics Division Conference, Hotel Statler, Los Angeles, California.

Mar. 1-3. Western Computer Conference and Exhibit, jointly sponsored by The IRE, AIEE, and ACM, Statler Hotel, Los Angeles, California.

Mar. 7-9. Chemical Institute of Canada, Chemical Engineering Div., Fifth Divisional Conference, Ottawa, Ontario.

Mar. 20-23. American Institute of Chemical Engineers, Kentucky Hotel, Louisville, Ky.

Mar. 29-*Apr.* 7. American Chemical Society, 127th meeting, Cincinnati, Ohio.

Mar. 30-*Apr.* 1. 17th Annual American Power Conference, Hotel Sherman, Chicago, Illinois.

Apr. 6-10. World Plastics Fair and Trade Exposition, National Guard Armory, Los Angeles, Calif.

Apr. 13-15. Conference on Biological Waste Treatment, Manhattan College, New York City.

Apr. 14-15. Chemical Institute of Canada and National Research Council, Sixth Canadian High Polymer Forum, St. Catharines, Ontario.

Apr. 17-20. American Oil Chemists' Society, 46th Annual Meeting, Roosevelt Hotel, New Orleans, Louisiana.

Apr. 18-21. American Management Association, 24th National Packaging Exposition, International Amphitheatre, Chicago, Illinois.

May 1-4. American Institute of Chemical Engineers, Shamrock Hotel, Houston, Texas.

May 16-20. National Materials Handling Exposition, International Amphitheatre, Chicago, Illinois.

May 23-27. American Society for Testing Materials, Third Annual Conference on Mass Spectrometry, Mark Hopkins Hotel, San Francisco, Calif.

May 31-*June* 3. Third Basic Materials Exposition, Convention Hall, Philadelphia, Pa.

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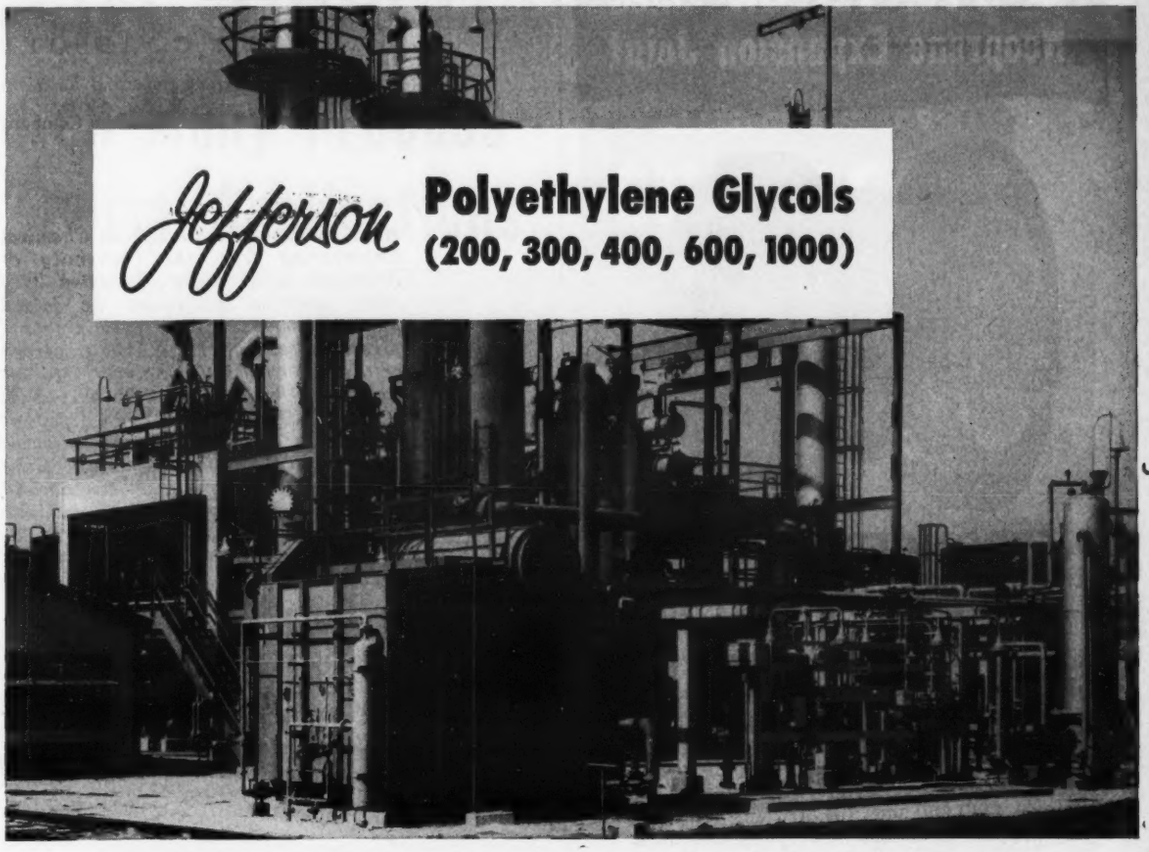

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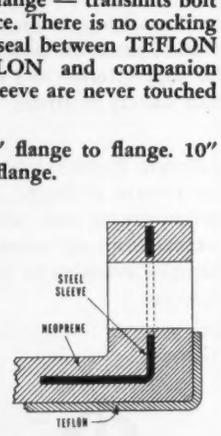
WORKING PRESSURE: THRU 10" 150 P.S.I. TEMPERATURE: 250° F.

This new expansion joint, developed by Doré, is built to meet the requirements of rugged service. The TEFLON tube, completely lining the neoprene and duck section, gives the joint the inertness of TEFLON plus the strength, temperature and pressure properties of neoprene and duck.

A steel sleeve imbedded in the center of the joint prevents distortion of the flange — transmits bolt pressure direct to flange face. There is no cocking of the flange to break the seal between TEFLON and Neoprene and TEFLON and companion flange. The duck or steel sleeve are never touched by line commodities.

Sizes 2" through 8" are 6" flange to flange. 10" and 12" are 6½" flange to flange.

Cross section detail of steel sleeve imbedded in the Neoprene and duck. In addition to strength and rigidity, the steel sleeve assures perfect flange to flange seal.



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FRED C. ABBOTT

Manager of Industrial Relations

Pennsylvania Salt Manufacturing Company

Fabian Bachrach photo

Mr. Abbott earned his B.S. in Chemical Engineering from the University of Arkansas. After being associated with other chemical companies, he joined Pennsalt in 1943. Before attaining his present position, Mr. Abbott served as Senior Chemical Engineer, Market Research Department; Manager, New Products Department; and Assistant Production Manager. His memberships include: ACS, AIChE, American Management Association, American Society of Personnel Administration, and the Industrial Relations Association, Philadelphia, of which he is president for 1954-55.

let's reappraise our industrial relations objectives

While industrial relations has been recognized as a functional activity for many years, it has become a major factor in our economic system only in the last decade or so. Upon reviewing the growth of industrial relations since the Mid-thirties, one gets the impression that many of us involved with the function are more often influenced in our activities and decisions by expediency than by plan. This impression exists despite constructive literature, outstanding research, and a broad scope of educational activity among institutions and associations, all showing that planning is possible and workable.

A similar look at unions, however, leaves the impression that expediency, while being a big factor, has not been the major influence. Instead, consistency of objective appears dominant in their growth and activities.

We industrial relations and management people give the appearance of defensiveness, seeming to be engaged in a strategic retreat without a fort at our back. What are we retreating from, when we should all be going forward in the same direction with a common goal?

In spite of the motivations of individuals and companies, large and small, the goal of our competitive enterprise system might be defined as an ever-increasing standard of living for all those willing and able to work for it, along with a measure of economic well-being for those unable to work. This goal seems consistent with our political philosophy and not inconsistent with the desires of unions, companies, self-employed persons, stockholders and the general public.

From this goal can spring industrial relations decisions and actions that are positive and creative, rather than defensive and negative. On this basis, differences in negotiations involve only method, not ideology.

This sameness of goal needs emphasis. Its implications require analysis. The fact that it exists may demand of all management people a reappraisal of policies, procedures, and techniques as they relate to our relationships with fellow employes, customers and shareowners, as well as the general public.

The defensiveness so often displayed by business and management derives directly from the impressions created by so-called "opposing forces" that we have a goal far different from that of

the public at large. Our failure to tell our story, to emphasize the sameness of goal, adds to those impressions. Our insistence upon acting like proprietors instead of professional managers adds further to them.

Without debating the merits of an economy dominated either by owner-management or professional management, it is a fact that the latter has become more and more the case in medium and large companies. Few managers today own controlling blocks of stock in their companies. This substitution of the professional manager for the owner, risk-taker manager has emphasized the sameness of goal. It brings with it a real opportunity, as well as an obligation, to get off the defensive by working with our fellow employes toward that common objective.

This "working with" may be the mechanism for controlling that ever-growing drive for more security at the expense of individual and group opportunity. The grasping for security that we have seen over the past two or three decades tends to promote mediocrity.

Only as it has opportunities to work toward a common goal does the family, the basic social unit, find its security. More important, this working toward a common goal seldom promotes mediocrity in members of a family. The security found through having common interests and common goals is intensified as each family member rises to the highest point permitted by his ability and diligence.

Bigger and more complex social units might gain the same sense of security, if their individual components fully realize that they, too, have the same goal. Professional management has the opportunity to prove this point without introduction of the paternalistic philosophy so prevalent with owner-manager companies.

How you relate this to your specific problems cannot be generalized. A reappraisal might, however, be fruitful.

CAN YOU WRITE . . .?

There is an immediate opening on our staff for a man who has an engineering or chemical background, some plant experience, a desire to travel (occasionally) and meet people . . . and some writing talent. If you're interested write: Personnel Director, CHEMICAL PROCESSING, 111 E. Delaware Place, Chicago 11, Ill. Include resume of education and experience, and a recent photo.

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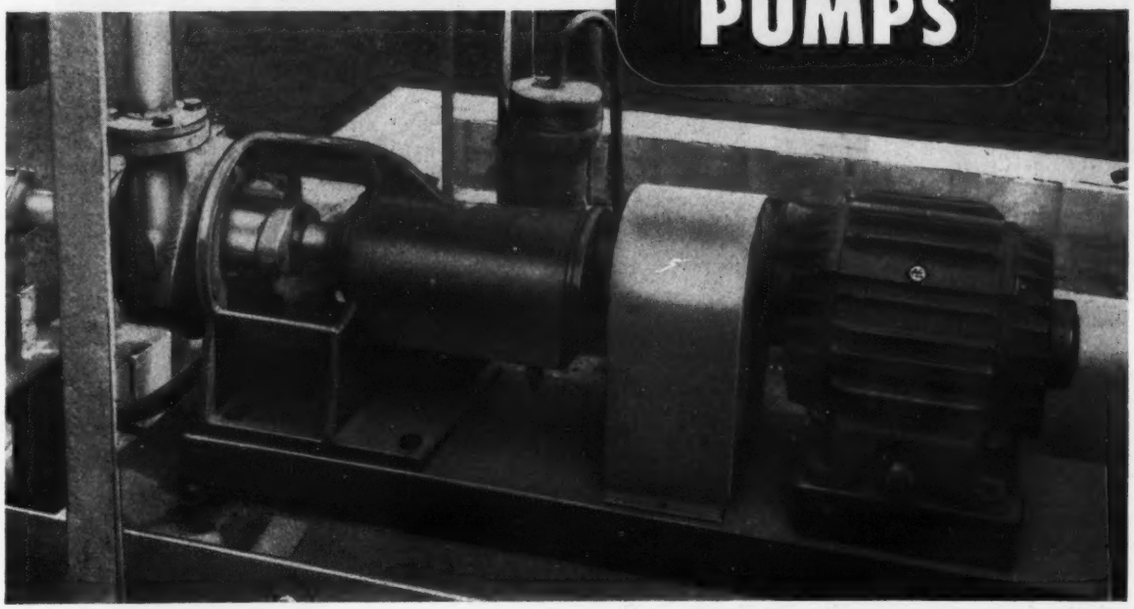

This pump will do many of the jobs of a costly refinery-type pump, yet it costs hundreds of dollars less to buy.

It isn't meant to do every job in the chemical industry. But it will handle a big percentage of the jobs. Check the construction and design features that make this possible:

- It's built in most used ratings . . . to 3500 gpm, heads up to 550 ft.
- Handles liquids in most common temperature range . . . up to 550 F.
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YARWAY FINE SCREEN STRAINERS

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what you can expect in next month's issue . . .

Chemical Claws

Next month, another in the series of Pioneer of Progress stories reports on "Chemical Claws" (chelating agents) and Versenes, Incorporated, whose pioneering efforts have made these compounds a fast-growing industry today.

These "claws" can reach into a chemical solution and grasp selected ions or substances. Discovery of chelation, brought about when iron — in the grasp of one such agent — would not precipitate from solution, has led to many end-uses, and more to come.

Today, such chemicals keep white soap white, cure sick citrus trees, decontaminate radioactive materials, combat heavy metal poisoning. From current research comes suggestion of partial cure to aging, senility.

To get the story, Associate Editor Bruce Fader visited Versenes' Framingham, Mass., plant. Talk with key men there has provided CP readers with Versenes' history, from inception to recent purchase by Dow.

Fats epoxidation — one-step method saves time, costs

Single-stage hydrogen peroxide-resin technique for upgrading unsaturated fats and oils has increased their usefulness as chemical intermediates. Economical method uses an acid cation exchange resin to convert peroxide and acetic acid to peracetic acid.

Advantages over conventional methods: epoxy content is increased even at reaction temps as high as 100°C; resins can be used many times over; it's no longer necessary to neutralize sulfuric acid catalyst formerly used.

Complete story of the process is the Materials section highlight for March.

Corrosion stopped, product improved in pumping formaldehyde

A "lead" at last year's Kansas City Corrosion Show led to a visit to Spencer Chemical's Calumet City, Ill., plant for a story on pumps which have not only solved a tough corrosion problem, but improved the product as well.

Here's a quick preview of features you'll find in March Chemical Processing

Spencer's acidic formaldehyde quickly ate most metals, but pumps now in operation have handled the corrosive solutions for six years with no ill effects. This negligible corrosion rate has also contributed to a very low iron content in the formaldehyde, a "must" in making light-colored resins for clear plastics.

Assistant Editor Frank E. McElroy and Works Manager Robert W. McKinney developed the story, featured in next month's Corrosion section.

High-temp lubricant increases compressor efficiency 20%

An installation report from the Mississippi Chemical Corp., Yazoo, Miss., gives details of a high-temperature lubricant which is providing a 20% increase in efficiency of air compressors used in nitric acid production. Lubricant allows operating temp of 460°F instead of former 400°F limit, cuts down time and maintenance costs.

Story, prepared by General Operations Manager W. B. Dunwoody and Assistant Editor Roy G. Helsing, is one of many Engineering and Maintenance features next month.

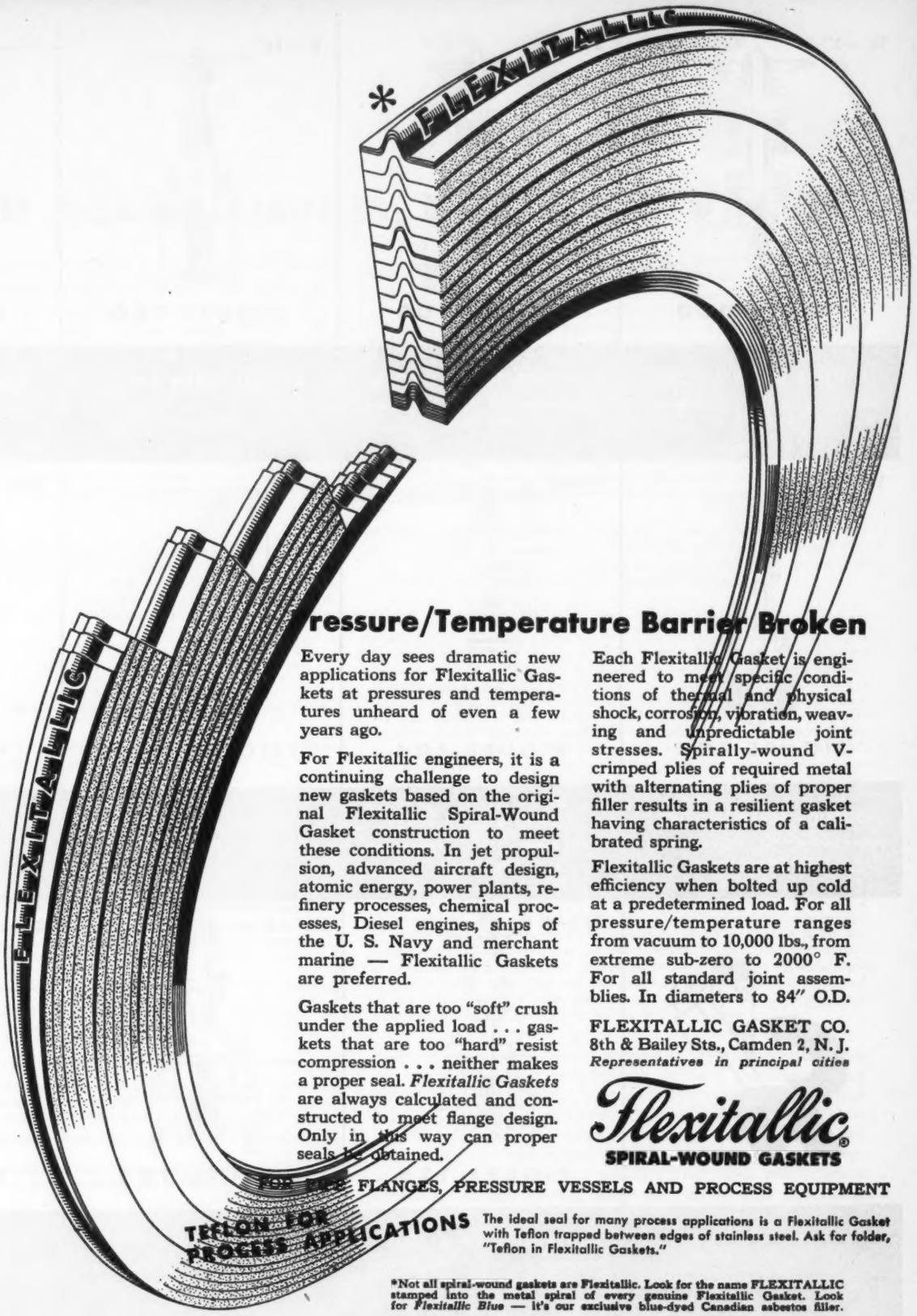
PVC plant uses PVC tape for corrosion service

Stories sometimes pop up when least expected . . . this was Associate Editor Gordon Weyermuller's experience in finding editorial material about uses for polyvinyl chloride tape. Editor Weyermuller attended the recent dedication of General Tire and Rubber's new polyvinyl chloride plant at Ashtabula, Ohio and discovered that tape of the same name was being used extensively to prevent corrosion in many interesting ways.

Gordon's story, prepared with the help of Plant Manager James Pollack, is our "New Solutions" highlight next month.

And in brief . . .

Up-to-date information on products, services, ideas appears in every regular section of CP.



ressure/Temperature Barrier Broken

Every day sees dramatic new applications for Flexitallic Gaskets at pressures and temperatures unheard of even a few years ago.

For Flexitallic engineers, it is a continuing challenge to design new gaskets based on the original Flexitallic Spiral-Wound Gasket construction to meet these conditions. In jet propulsion, advanced aircraft design, atomic energy, power plants, refinery processes, chemical processes, Diesel engines, ships of the U. S. Navy and merchant marine — Flexitallic Gaskets are preferred.

Gaskets that are too "soft" crush under the applied load . . . gaskets that are too "hard" resist compression . . . neither makes a proper seal. *Flexitallic Gaskets* are always calculated and constructed to meet flange design. Only in this way can proper seals be obtained.

Each Flexitallic Gasket is engineered to meet specific conditions of thermal and physical shock, corrosion, vibration, weaving and unpredictable joint stresses. Spirally-wound V-crimped plies of required metal with alternating plies of proper filler results in a resilient gasket having characteristics of a calibrated spring.

Flexitallic Gaskets are at highest efficiency when bolted up cold at a predetermined load. For all pressure/temperature ranges from vacuum to 10,000 lbs., from extreme sub-zero to 2000° F. For all standard joint assemblies. In diameters to 84" O.D.

FLEXITALLIC GASKET CO.
8th & Bailey Sts., Camden 2, N. J.
Representatives in principal cities

Flexitallic®
SPIRAL-WOUND GASKETS
FOR FLANGES, PRESSURE VESSELS AND PROCESS EQUIPMENT

TEFLON FOR PROCESS APPLICATIONS — The ideal seal for many process applications is a Flexitallic Gasket with Teflon trapped between edges of stainless steel. Ask for folder, "Teflon in Flexitallic Gaskets."

*Not all spiral-wound gaskets are Flexitallic. Look for the name FLEXITALLIC stamped into the metal spiral of every genuine Flexitallic Gasket. Look for *Flexitallic Blue* — it's our exclusive blue-dyed Canadian asbestos filler.

When inquiring check CP 4891 opposite last page

½"—2"

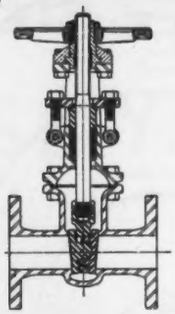


FIGURE 100

OUTSIDE SCREW & YOKE
Bolted Bonnet · Flanged ends
150 # Service

2½"—6"

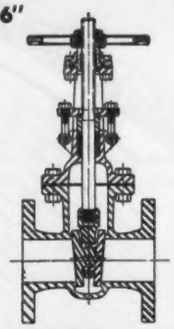


FIGURE 100

OUTSIDE SCREW & YOKE
Bolted Bonnet · Flanged ends
150 # Service

8"—18"

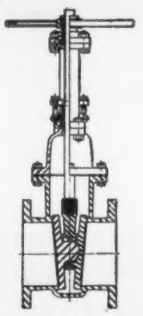


FIGURE 100

OUTSIDE SCREW & YOKE
Bolted Bonnet · Flanged ends
150 # Service

½"—2"

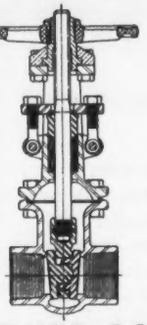


FIGURE 101

OUTSIDE SCREW & YOKE
Bolted Bonnet · Screwed ends
150 # Service

2½"—6"

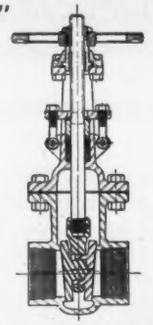


FIGURE 101

OUTSIDE SCREW & YOKE
Bolted Bonnet · Screwed ends
150 # Service

½"—6"

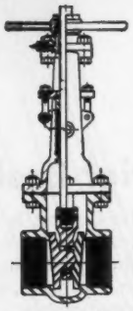


FIGURE 103

OUTSIDE SCREW & YOKE
Bolted Bonnet · Screwed ends
150 # Vacuum Service

½"—6"

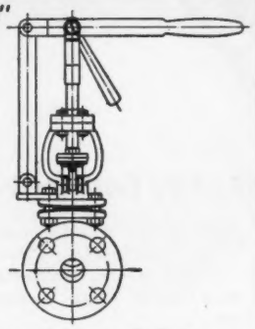


FIGURE 104

SLIDING STEM & LEVER
Bolted Bonnet · Flanged ends
150 # Service

½"—6"

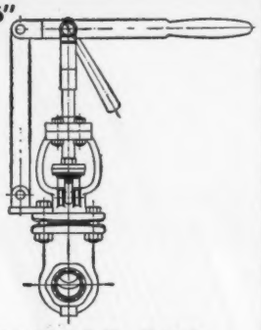


FIGURE 105

SLIDING STEM & LEVER
Bolted Bonnet · Screwed ends
150 # Service

½"—1"

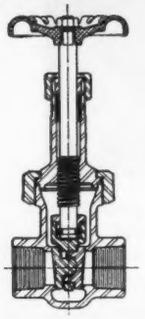


FIGURE 115

INSIDE SCREW RISING STEM
Union Bonnet · Screwed ends
200 # Service

½"—2"

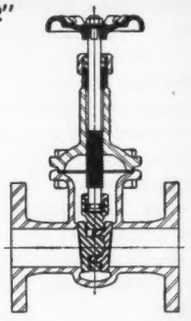


FIGURE 116

INSIDE SCREW RISING STEM
Bolted Bonnet · Flanged ends
150 # Service

½"—1"

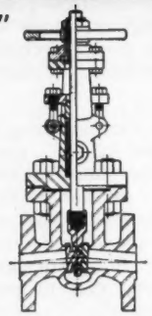


FIGURE 125

OUTSIDE SCREW & YOKE
Bolted Bonnet · Flanged ends
300 # Service

1¼"—6"

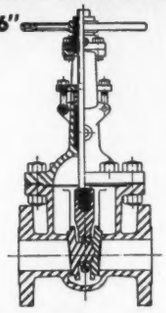


FIGURE 125

OUTSIDE SCREW & YOKE
Bolted Bonnet · Flanged ends
300 # Service

8"—10"

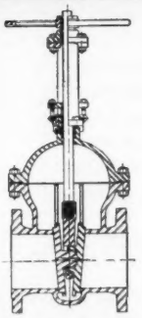


FIGURE 125

OUTSIDE SCREW & YOKE
Bolted Bonnet · Flanged ends
300 # Service

1"—3"

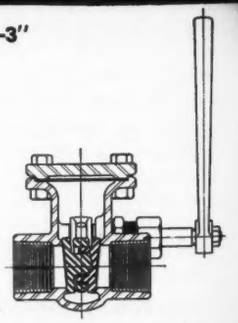
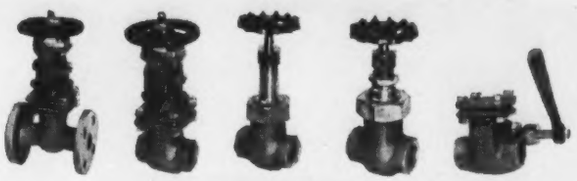


FIGURE 270

LEVER OPERATED QUICK OPENING
Bolted Cover · Screwed ends
150 # Service



COOPER ALLOY STAINLESS STEEL GATE VALVES

½"—6"

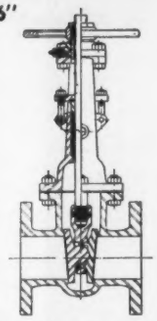


FIGURE 102

OUTSIDE SCREW & YOKE
Bolted Bonnet · Flanged ends
150 # Vacuum Service

½"—2"

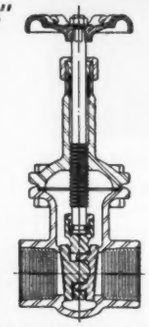


FIGURE 117

INSIDE SCREW RISING STEM
Bolted Bonnet · Screwed ends
150 # Service

½"—1"

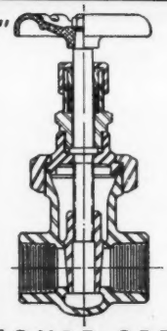


FIGURE 3151

INSIDE SCREW NON-RISING STEM
Union Bonnet · Screwed ends
200 # Service

• Cooper Alloy gate valves are designed for the handling of gas or liquids which are comparatively clean and free from foreign matter, and for use whenever low pressure drop and unobstructed flow are required. Here are the design features incorporated in the Cooper Alloy valve which make it outstanding for service and reliability:

DESIGN FACTORS

HANDWHEELS: Handwheels are designed to provide maximum ease of operation. Diameters are adequate to provide tight valve closure without the use of wrenches or levers. Small handwheels of the ventilated type incorporate scalloped edges for positive gripping. Larger handwheels are also designed for positive non-slip gripping. All handwheels are rugged and are capable of withstanding hard usage.

OPERATING MECHANISM: Cooper Alloy OS & Y gate valves have bolted cap construction so that the threaded bushing or yoke nut is replaceable without disassembling the valve. This construction also eliminates all thrust from the handwheel permitting removal or replacement without interfering with the setting of the valve. A fitting is provided to lubricate the thrust surface.

COOPER ALLOY valves are regularly stocked in the stainless materials shown below.

As the world's largest producer of corrosion resistant alloys Cooper Alloy can provide valves in any of the stainless alloys, as well as in nickel or monel.

ALLOY	APPLICATIONS AND REMARKS
18-8S* (304)	General purpose corrosion resistant alloy for applications in chemical, pharmaceutical, textile and food processing industries, and in oil refineries. Carbon is held low for maximum corrosion resistance.
18-8SCb (347)	The addition of columbium permits welding without subsequent heat treatment. Uses are identical to 18-8S, except that it is often specified where field fabrication is required.
18-8SMo* (316)	The molybdenum addition to the 18/8 analysis gives added corrosion resistance in sulfite liquors and many chemicals, reduces pitting corrosion, and helps prevent intergranular type corrosion.
20-29MoCu (FA-20)	An alloy developed primarily for use in hot sulfuric acid of most concentrations. Has superior resistance to 18/8SMo in all media.

*These alloys are available with carbon content held to .03% max. and are recommended in this ELC analysis where heat treatment after welding is difficult or impossible.

YOKE DESIGN: Cooper Alloy outside screw and yoke valves incorporate a bowed yoke construction which provides the flexibility needed to reduce strain on the stem threads; and it is particularly desirable where variations in temperature result in elongation of the stem. This often causes jamming of the operating threads in conventional valves, but it is compensated for in the bowed yoke of Cooper Alloy valves.

STUFFING BOXES: Packing in Cooper Alloy valves is oversized to provide maximum protection against leakage. Square compression is incorporated to provide uniform loading of packing rings. All outside screw type valves incorporate a two piece gland follower and gland flange arrangement which eliminates the possibility of uneven tightening and resultant scoring of the centerless ground stem. Gland flange is secured by means of two stainless steel swinging eye bolts, thus eliminating the possibility of lost bolts and subsequent replacement with bolts not corrosion resistant.

PACKING AND GASKETS: Cooper Alloy valves are normally furnished with blue African asbestos packing and gaskets. Packing is externally finished with mica. Solid molded plastic "V" rings are available on request, as are a variety of specially engineered materials for unusual conditions.

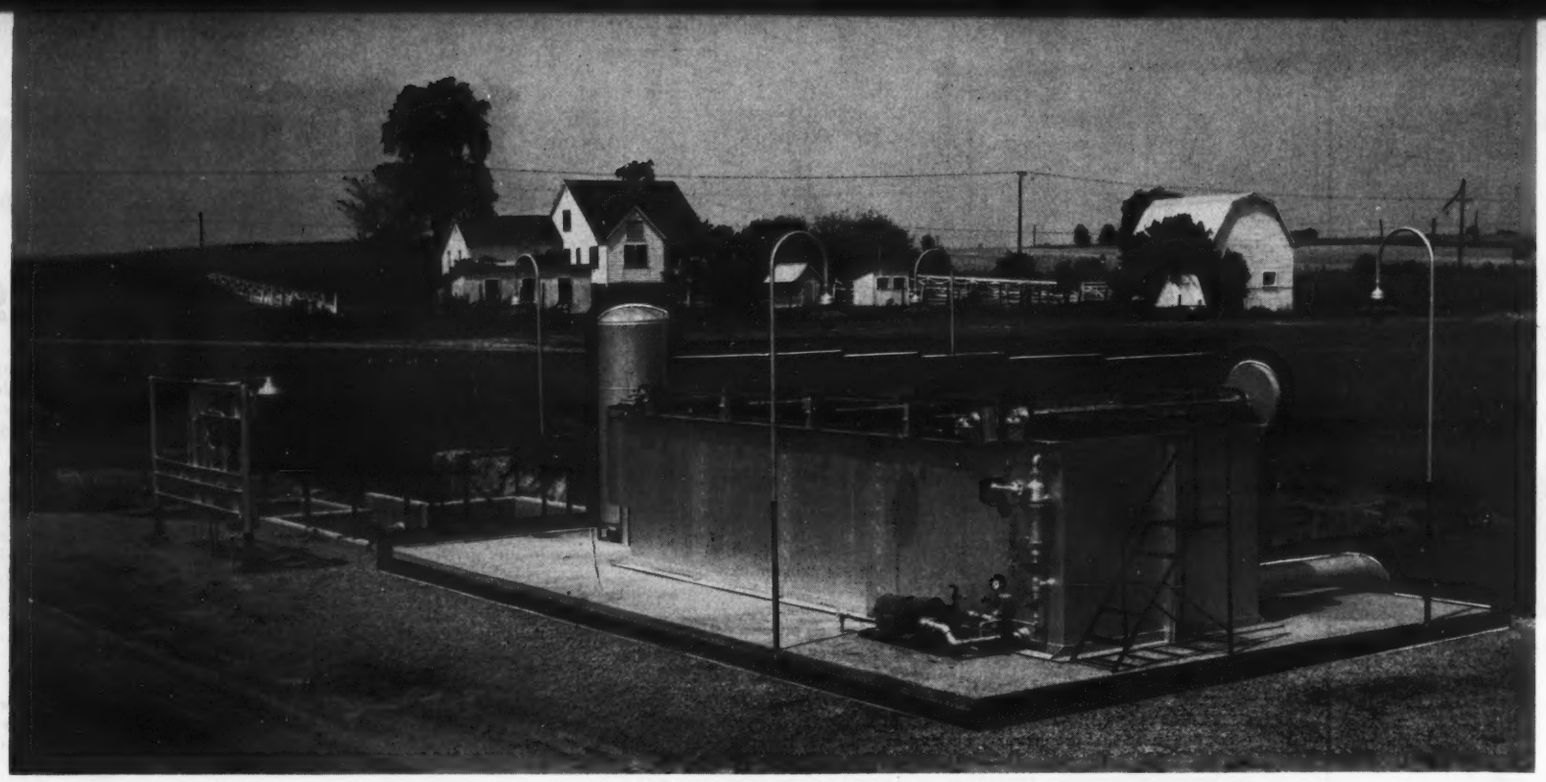
BONNET TO BODY JOINT: Cooper Alloy inside screw type valves are provided with a union type bonnet joint. This construction, which eliminates threads from contact with the product, is very desirable in service where galling, corrosion and product contamination are factors. The bonnet is self-aligning and seating surfaces are made up without rotation, eliminating a serious source of galling. Wherever possible bolted joints of OS & Y valves are male and female with a retained gasket. This type of joint is desirable because uniform and higher gasket loading, which results in tighter joints, can be accomplished with less bolting than would be required on flat, full face gaskets. Bolting is entirely outside the gasket area eliminating the possibility of corrosion due to hidden leakage through the gasket into the bolt area.

GATE VALVE DISCS: Cooper Alloy gate valves are normally furnished with ball and socket rotating type discs. This type of disc construction has been proven best for use in stainless steel valves. It lessens the tendency toward galling which is prevalent in solid wedge type valves and is far easier to maintain. Slight body seat angular variations caused by temperature changes are compensated for readily by this type of construction. Where non-rotating stems are used, integrally forged stems and disc arms eliminate the possibility of crevice corrosion at threaded joints. Rotating stems are secured to the disc arms by means of a split collar and swivel screw. There are however, certain applications, usually involving suspended solids or resinous type materials subject to solidification, that may interfere with the satisfactory performance of the double disc type gate valve described above. For these applications solid wedge discs are available for all OS & Y gate valves.

Designed by valve engineers working in close cooperation with specialists in stainless steel foundry technics, the Cooper Alloy valve is synonomous with top design and top quality. Sold through industrial distributors, mill supply houses, and piping distributors with branches and warehouses in key cities, backed up by a network of regional representatives and a highly trained sales engineering group, Cooper Alloy stainless steel valves and technical service are as near as your telephone. Call or write for catalog.

COOPER ALLOY
CORPORATION • HILLSIDE, N. J.
Valve & Fitting Division

When inquiring check CP 4892 opposite last page



General view of waste water treating equipment at Indiana Farm Bureau's oil refinery at Mt. Vernon, Indiana. Compact unit processes 340,000 gal/day, and . . .

removes oil by dissolved-air flotation

Air bubbles occlude suspensoid's particles as they rise, remove contaminants from water before discharge to creek

S. E. JACOBSEN, Refinery Superintendent
Indiana Farm Bureau Cooperative Association, Inc.
with **TED F. MEINHOLD,** Assistant Editor

Problem: Waste water being discharged into Mill Creek from Indiana Farm Bureau Cooperative's oil refinery was found to contain a higher oil content than the maximum allowable limit imposed by the state. The appearance and odor of the contaminated water also disturbed officials, because the stream passes right through the nearby town of Mt. Vernon, Indiana.

Practice was to put the water through a series of baffled catch basins, which slowed flow and caused most of the free oil to rise to the top so it could be skimmed off and reclaimed. The partially clarified water was then submitted to stepped aeration before being dumped into creek.

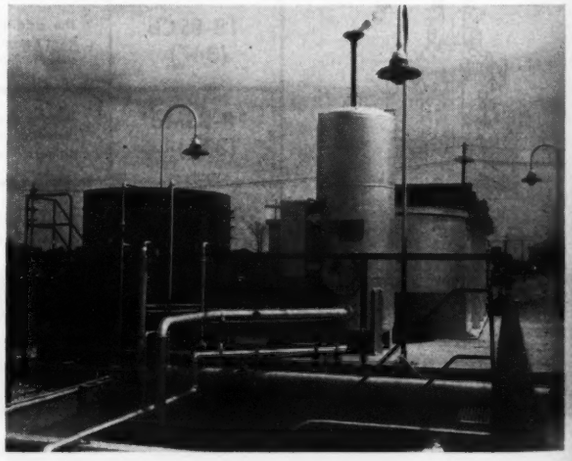
Solution: The Cooperative installed a 400-gpm dissolved-air flotation unit. Called a Colloidair Separator, it operates on effluent from the catch basins. Unit is fed by its own pumping and air injection system, and has its own control network and retention tank.

A measured quantity of air is injected into feed before it enters retention tank. Pressure (30 psi) in tank causes most of air to be dissolved in the water. Undissolved air is bled off continuously at top of tank.

Water and dissolved air leave tank through an automatic pressure-regulating valve, which obtains its signal from a pressure controller. Water then enters bottom of flotation unit's inlet chamber through a nozzle and around a circular diffusion plate located directly above it. Reduced pressure on water, as it passes through valve, causes dissolved air to be released as a myriad of minute bubbles. Water then passes over a weir, so only slight turbulence results when water enters flotation chamber.

Air bubbles rising to surface float the suspensoids by occlusion. Skimming blades, fastened to an endless chain, slowly sweep aerated skimmings to far end of chamber where they are swept over a ramp and into the recovery chamber. Recovered sludge is sent back and recycled through catch basins.

Inlet of dissolved-air flotation unit. Measured quantity of air is injected into feed in retention tank (center) at 30 psi. Standby chemical-treatment equipment (wooden tank) is at left



new solutions of processing problems

Clarified water is removed through three parallel outlet tubes on bottom of flotation chamber, at right angles to line of flow. Each tube is connected to a riser on outside of chamber. Tubes discharge into a clarified water chamber having same length as flotation chamber. Each riser has adjustable sleeve at top so that level in flotation chamber can be regulated. Clarified water flows by gravity from water chamber into creek.

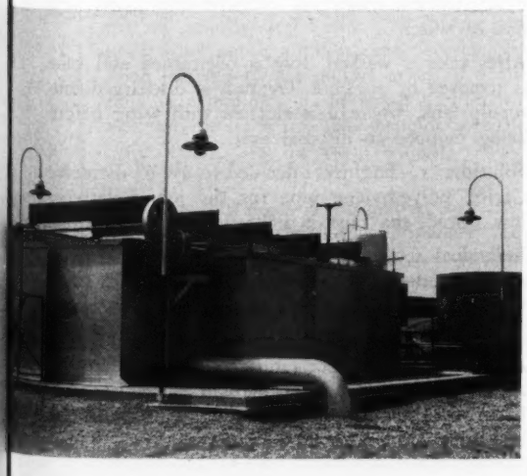
Results: Use of flotation unit has reduced suspended solids and oil in waste water, lowered BOD, and raised dissolved oxygen content, so that waste sent to creek is in conformance with pollution abatement standards of Indiana State Board of Health. Table shows analysis of influent to flotation unit and effluent from flotation unit.

(Colloidair Separators are products of Bulkley, Dunton Processes, Inc., Dept. CP, 295 Madison Avenue, New York 17, N.Y. . . . or check CP 4893 on handy form opposite last page.)

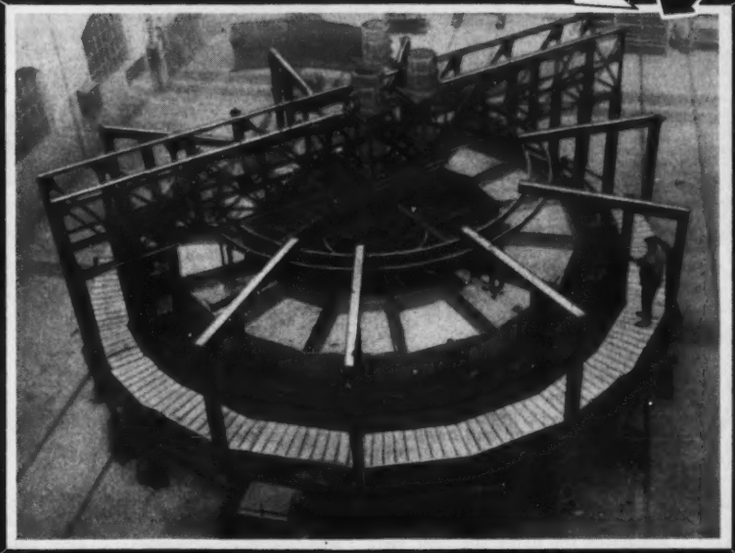
Results at Indiana Farm Bureau Cooperative Association

	Influent to Colloidair	Effluent from Colloidair	% Removal
BOD, ppm	680.0	150.0	78
pH	8.9	8.8	
Alkalinity, M. O., ppm	810.0	584.0	
Total solids, ppm	1461.0	1017.0	
Total volatile solids, ppm	367.0	153.0	
Suspended solids, ppm	612.0	41.0	93
Suspended volatile solids, ppm	294.0	15.0	92
Oil, ppm	200.0	15.0-25.0	88-92

Flotation chamber's skimming blades sweep aerated skimming into collection chamber



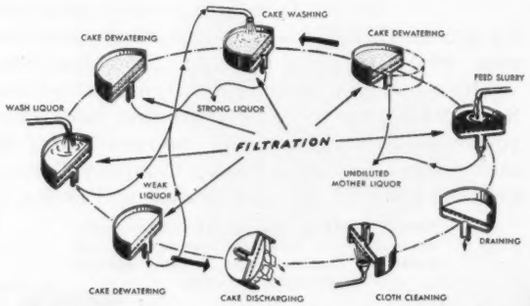
LOOK INTO THIS



BIRD-PRAYON CONTINUOUS ROTARY HORIZONTAL VACUUM FILTER

if you're looking for —

a better way to filter such materials as coarse or heavy solids, metallic concentrates or any material that tends to blind filter cloths; available in six sizes providing from 27 to 516 sq. ft. of filter area.



The Bird-Prayon Filter provides this complete, automatic filtration cycle

extraordinary washing efficiency — counter-current washing in several stages with NO dilution of mother liquor. Minimum wash water. Maximum soluble recovery.

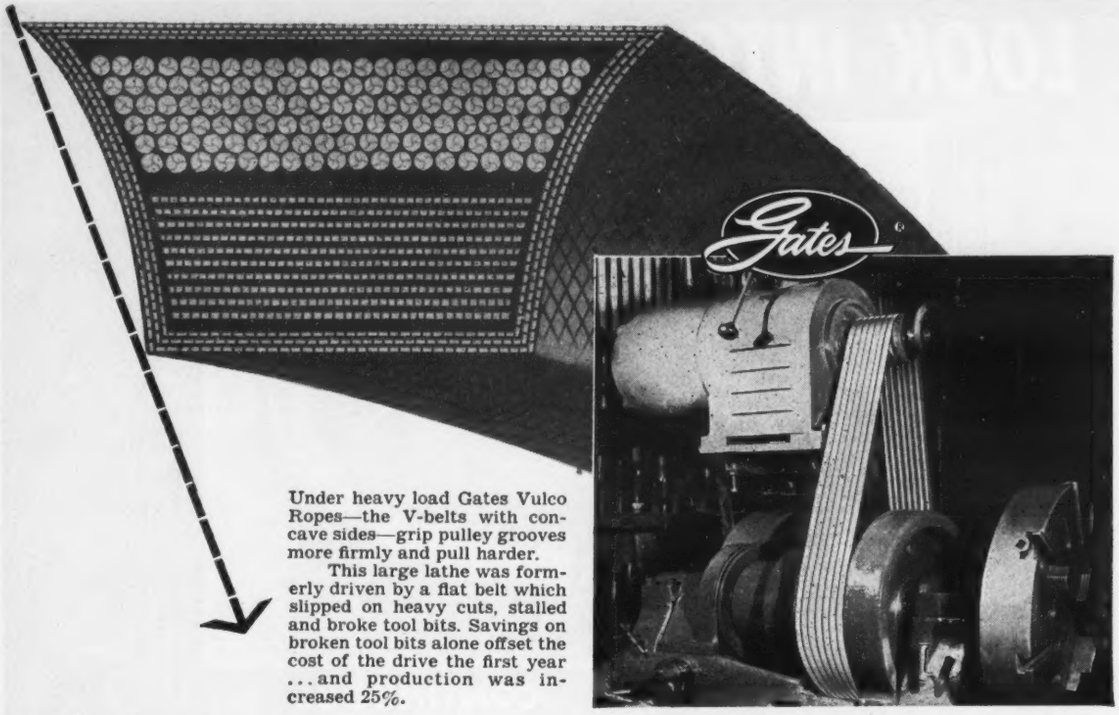
extraordinary operating efficiency and economy — complete discharge effected by cell inversion and back pressure; filter cloths last a long time; they are washed between every filtration; they may be replaced one cell at a time.

Pilot scale test data are readily secured.

A NEW BULLETIN on this remarkable Filter is just off the press. Ask us to mail you a copy.

BIRD MACHINE COMPANY
SOUTH WALPOLE, MASSACHUSETTS

When inquiring check CP 4894 opposite last page



Under heavy load Gates Vulco Ropes—the V-belts with concave sides—grip pulley grooves more firmly and pull harder.

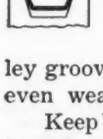
This large lathe was formerly driven by a flat belt which slipped on heavy cuts, stalled and broke tool bits. Savings on broken tool bits alone offset the cost of the drive the first year ... and production was increased 25%.

Concave sides keep belt costs down!

Industry is saving thousands and thousands of dollars every year by specifying Gates Vulco Ropes—the V-Belts with *concave sides* (U.S. Pat. No. 1813698).

Here's the interesting reason *why* Gates belts save money:

On the bend around the sheave the *precisely engineered* concave sides (Fig. 1) of the Gates belt fill out and become straight (Fig. 1-A). Thus the belt makes uniform contact with the sides of the pulley. That means sure pulling power and *even distribution of wear.* Longer wear, fewer replacements cut belt costs...reduce down time...contribute to profits.



Simple test proves value of concave sides

Bend a straight-sided belt (Fig. 2) and feel the sides *bulge out* around the bend. The bulging sides prevent the belt from fitting evenly in the pulley groove (Fig. 2-A). Uneven contact causes uneven wear...shortens belt life...increases costs.

Keep belt costs *down* by specifying Gates Vulco Rope Drives—the V-Belt with *concave sides.* Belts you need are readily available from nearby distributor stocks. The Gates Rubber Company, Denver, Colorado—*World's Largest Maker of V-Belts.*

Gates Engineering Offices and Distributor Stocks are located in all industrial centers of the United States and Canada, and in 70 other countries throughout the world.

TPA 28-A

GATES VULCO ROPE DRIVES

When inquiring check CP 4895 opposite last page

Acid plant sends waste product to disposal area through 6" flexible plastic pipe . . .

gypsum slurry pumped at rate of 400,000 lb per day through 980 ft of polyethylene pipe

Problem: An economic way of carrying abrasive, slightly acidic, gypsum waste slurry to 980-foot-away disposal area was sought by Smith-Douglass Company, Inc., Streator, Illinois. The plant operates with a 95% yield from rock, producing phosphoric acid containing 30% P_2O_5, by the

Polyethylene pipe crosses bridge near phosphoric acid plant. Pipe on right carries waste product from plant to disposal area. Pipe on left brings water into plant

Belgian Prayon process. First of its kind in this country, the plant was completed through the cooperative efforts of Smith-Douglass Company and Singmaster and Breyer, New York engineering firm, who designed and managed construction of plant.

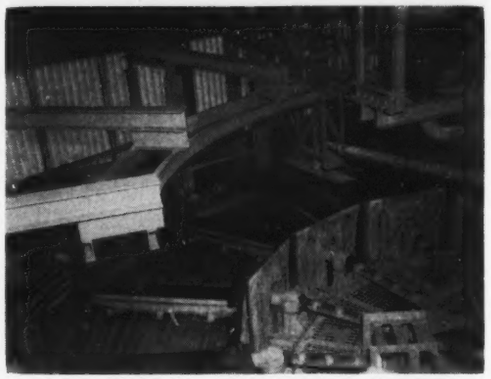
In the process, finely ground phosphate rock is mixed with recycled phosphoric acid and reacted with sulfuric acid. Precipitated gypsum is removed from the acid by a Prayon filter — a horizontal, revolving machine, 28 ft in diameter, having 15 individual trays. Cake is washed free of acid by two countercurrent washes of recycled dilute acid and one of water.

After cake is washed, tray is overturned and cake is removed by air blast. Gypsum is discharged into repulp tank, where it is slurried with water before being pumped to disposal area.

Solution: Engineers decided to use 6" diameter Carlon polyethylene pipe for the job. Relatively low priced, the pipe is light, tough, and flexible.

Individual sections are easily joined together with plastic insert couplings, and then fastened with stainless steel bands. Plastic adapters are used to attach plastic pipe to regular metal pipe.

Results: In use since January 1954, pipe handles about 400,000 pounds of gypsum slurry per day. Installation was simple. On flat terrain, pipe is just laid on ground, with no supports needed.



Belgian revolving tray filter used in phosphoric acid plant, boasts higher washing efficency with les water. Filters are handled in U.S. by Bird Machine Company, South Walpole, Massachusetts

Because of its low weight, pipe floats on the surface of disposal lagoon, simplifying distribution of waste product. Similar pipe is used to carry process water from nearby lake to plant.

(Polyethylene pipe is product of Carlon Products Corporation, Dept. CP, 10223 Meech Avenue, Cleveland 5, Ohio . . . or for more information check CP 4896 opposite last page.)

Are you wondering why many of these editorial articles give . . .

Manufacturer's Name and Address . . . ?

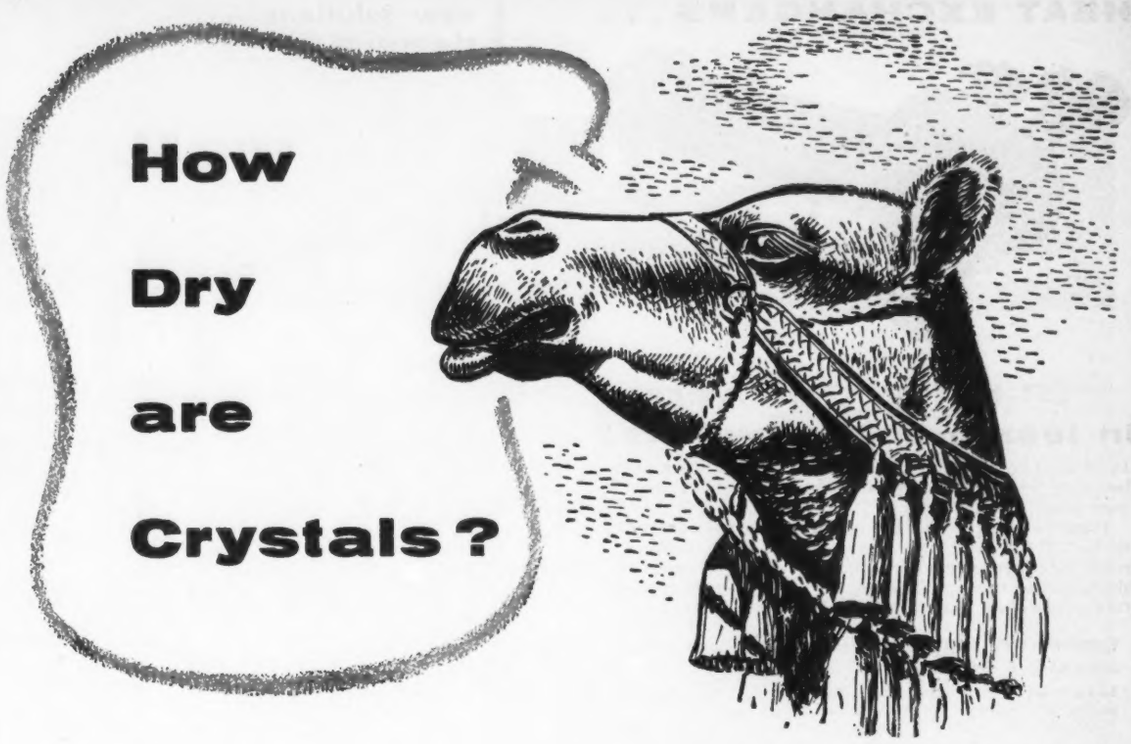
You doubtless have noted names and addresses of manufacturers at the end of editorial articles in CHEMICAL PROCESSING. Have you wondered, "Is this some sort of advertising?"

It isn't . . . that "source" is there because the editors know that often you want more information, quickly and easily. Of course, such articles are purely editorial material which has been selected by the editors as being worthy of your attention . . . (it is **not** carried with any responsibility to the manufacturer nor does it obligate the manufacturer). This is strictly a service for you . . . the reader.

We know that many readers often want more than just the pertinent description and facts . . so we tell you where and how you can obtain complete details, either by writing direct or using the handy Reader Service slip.

This is one of our extra Reader Services, pioneered in this field by CHEMICAL PROCESSING in 1938.

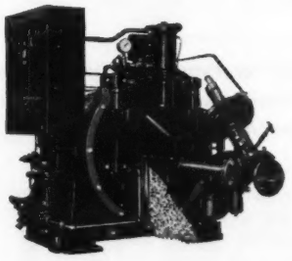
THE EDITORS



▪ ▪ ▪ as dry as you desire—and produced continuously from slurries at the rate of up to 8 tons of high purity crystals per hour.

That is only part of the story of the Sharples Super-D-Hydrator: this high speed dehydrating centrifuge provides precise external control of variations in flow rate, crystal size, and slurry concentration, and permits intermediate treatment of crystals as required.

Enjoy the advantages of the complete flexibility of the Super-D-Hydrator—which result in predictable crystal purity, dryness to specification, continuous high production, and trouble-free operation.



You may count on the wide experience of The Sharples Corporation in the field of improved crystal dehydration. We will be pleased to discuss your specific problems personally, or Bulletin 1257 will be sent upon request.

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When inquiring check CP 4897 opposite last page

HEAT EXCHANGERS . . .

"Off-the-shelf" **delivery**

in less than two weeks!

In 14 days or less, any of these six sizes of Pfaudler stainless steel heat exchangers can be speeding on its way to your plant!

Pfaudler's new stocking program, plus standard design, make "off-the-shelf" delivery possible. These units are ready for almost immediate shipment and are all fixed tube sheet design. Shell and baffles are made of carbon steel; tubes, tube sheets and bonnets, stainless steel.

DIMENSIONS AND PRICES (on all prices, add $40 if code stamp is required).

56 sq. ft. size—8″ nominal shell diameter; 72″ tube length; baffles on 4″ centers; Type 316 tubes; single pass.
Price . . . $1199 f.o.b. Elyria, Ohio

101 sq. ft. size—10″ nominal shell diameter; 96″ tube length; baffles on 5″ centers; Type 316 tubes; six pass.
Price . . . $1758 f.o.b. Elyria, Ohio

104 sq. ft. size—10″ nominal shell diameter; 84″ tube length; baffles on 5″ centers; Type 316 or 304 tubes; single pass.
Price . . . Type 316 . . . $1648 f.o.b. Elyria, Ohio
Type 304 . . . $1437 f.o.b. Elyria, Ohio

149 sq. ft. size—10″ nominal shell diameter; 120″ tube length; baffles on 5″ centers; Type 316 tubes; single pass.
Price . . . $1943 f.o.b. Elyria, Ohio

216 sq. ft. size—12″ nominal shell diameter; 120″ tube length; baffles on 6″ centers; Type 316 tubes; single pass.
Price . . . $2622 f.o.b. Elyria, Ohio

316 sq. ft. size—14″ nominal shell diameter; 144″ tube length; baffles on 7″ centers; Type 316 tubes; single pass.
Price . . . $3704 f.o.b. Elyria, Ohio

Also available for fast delivery, are a wide variety of other sizes: 4 weeks delivery on all standard single pass units up through 10″ diameter. 6 weeks delivery on all standard multipass units up through 10″ diameter. 6-8 weeks delivery on all standard units 12″ in diameter and above.

For a fast, effective answer to that heat exchanger problem, call your nearest Pfaudler office or mail the coupon.

Pfaudler

THE PFAUDLER CO., Dept. CP-2 Rochester 3, N. Y.

☐ Send me your heat exchanger catalog.
☐ Send a salesman! I need heat exchanger help!

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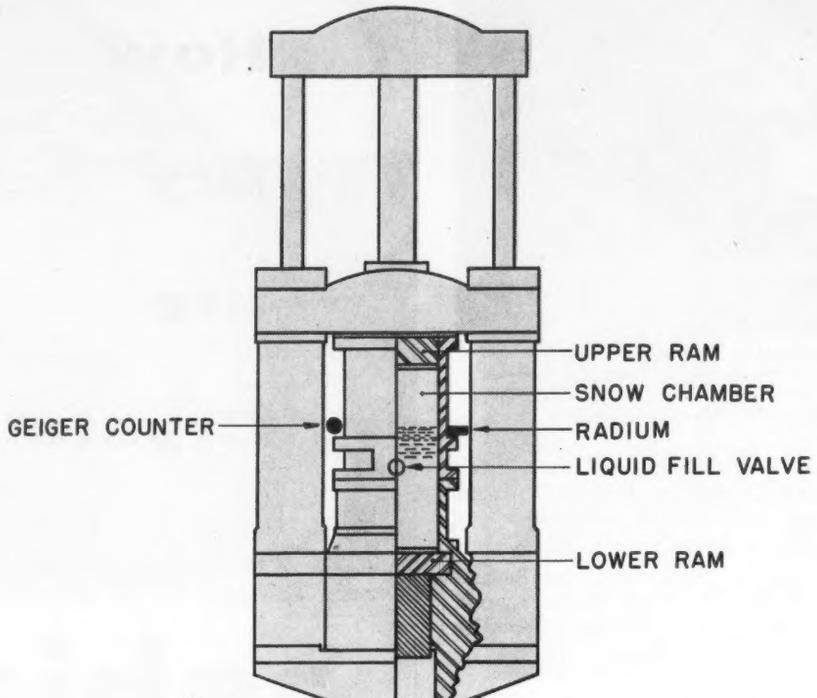
Company_____

Street_____

City_____ Zone____ State_____

When inquiring check CP 4898 opposite last page

new solutions
of processing problems



Simplified drawing shows location of gamma ray source and detector

At Brea Chemicals' dry ice plant, gamma rays —

provide automatic level control for charging CO_2 presses

Control system eliminates pressure taps into snow chamber and need for separate measuring tanks

By **J. W. BUDDENBERG**
Assistant Operations Superintendent
Brea Chemicals, Inc., Brea, California

with **CP STAFF**

Problem: In design of its 70-ton per day dry ice plant at Brea, California, engineers of Brea Chemicals, Inc. had to automatically control carbon dioxide liquid level for batch-filling of three dry ice presses.

Use of conventional level control devices involves two pressure taps into snow chamber. This method leaves something to be desired because instrument lead lines sometimes plug with carbon dioxide snow. Another drawback to this conventional method is that instrument must be isolated from snow chamber during part of press cycle. Some dry ice manufacturers use separate tanks for measuring prior to filling chamber but this increases length of cycle.

Solution: Brea engineers selected Densitron as a level control device. Taking advantage of the penetrating properties of gamma rays, unit affords level control without pressure taps. Densitron is integral part of completely automatic cycle control system.

Hydraulic rams compress carbon dioxide snow to 1100 psi to produce dry ice. Panels (in foreground) house amplifiers and controls for Densitron units

Level controller consists of gamma ray source (3 mg of radium per press) mounted at proper level on one side of snow chamber. Gamma ray emission is in narrow conical beam, further limited by partial lead shield about Geiger tube to improve response rate. Radiation passes through 3" of cast steel and approximately 22" of air in valve-open control position, and through 20" of liquid carbon dioxide in valve-closed position. Geiger tube and pre-amplifier are mounted on opposite side of chamber. Output from unit controls pneumatically-operated fill valve through relay and solenoid arrangement.

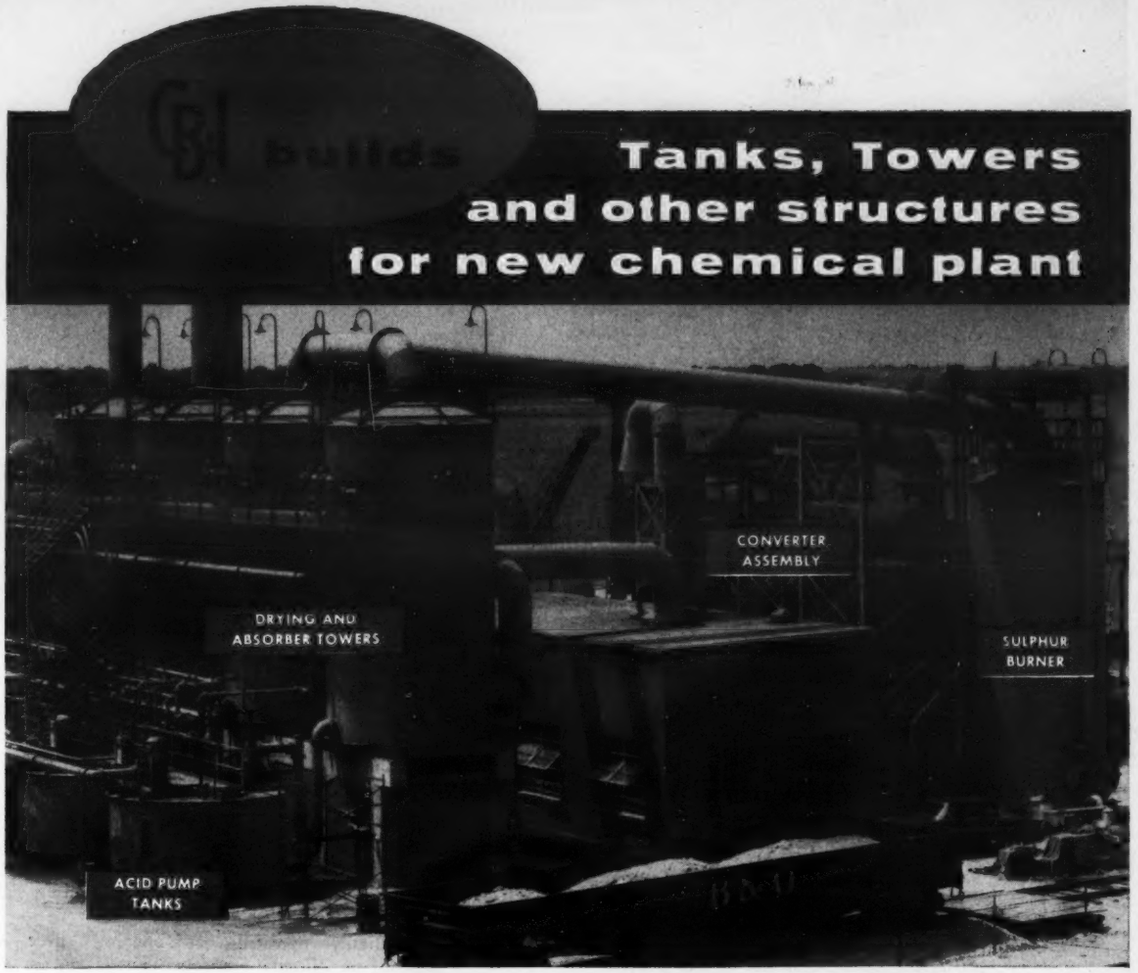
Results: Operation of Densitron control equipment on three dry ice presses has been satisfactory. Radiation exposure to personnel is negligible and re-radiation from dry ice does not occur. Change in signal strength at control liquid level is sufficient for sure operation of relays and solenoids.

(Densitron is a product of Instruments, Inc., Dept. CP, 122 N. Madison St., Tulsa 6, Okla. . . . or for more information check CP 4899 on handy form opposite last page.)

Illustrated bulletin tells benefits of industrial gas equipment

Illustrated with on-the-spot photographs, 22-page bulletin describes 17 case histories of how companies benefited through use of manufacturer's immersion heaters, dryers, and inert gas generators. Installations include chemical, oil, and steel plants.

Bul G-10 is issued by C. M. Kemp Manufacturing Company, Dept. CP, 405 E. Oliver Street, Baltimore 2, Maryland. When inquiring specify CP 4900 on handy form opposite last page.



● Shown above are tanks and towers and special steel plate structures fabricated and erected by CB&I for the United States Industrial Chemicals Company at Tuscola, Illinois. If it's true that a "picture is worth a thousand words", this view should speak volumes about the wide variety of tanks and special steel plate structures that we are equipped to build for your processing operations.

When planning new structures, whether it's one tank or outfitting a complete new plant, we would like an opportunity to quote on your needs. Write our nearest office for complete information.

CB&I

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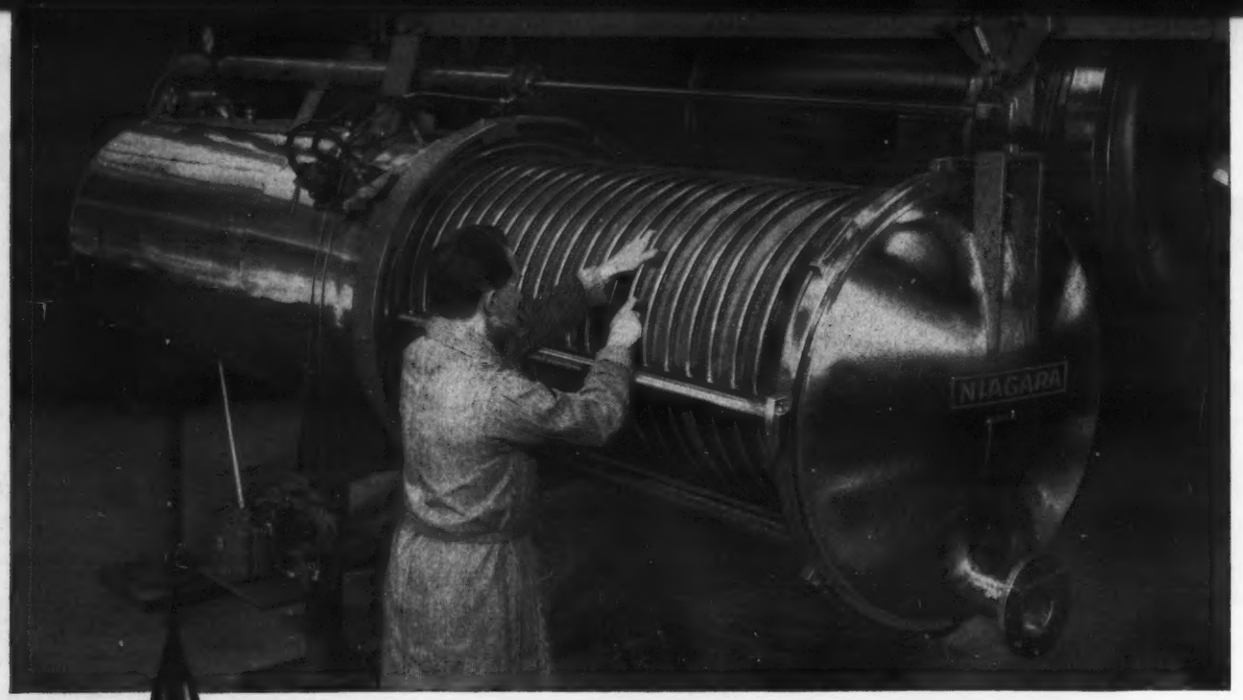
Plants in BIRMINGHAM, CHICAGO, SALT LAKE CITY and GREENVILLE, PA.

When inquiring check CP 4901 opposite last page



This new Niagara makes outdated filters a costly luxury

Is your plant still using old-fashioned presses for the filtration step? Even if those filter presses are just as good as the day you bought them . . . *they're still taking dollars right out of your pocket.*

Doubt it? All right . . . just compare your present labor cost and production figures with the time-and-money-saving advantages you could have with a Niagara Horizontal Pressure Leaf Filter. For example:

- ☆ Flow rates are 2 to 5 times greater than with cloth covered presses.
- ☆ A Niagara can be drained, opened, cleaned, closed, filled and precoated . . . by *one* man . . . in a matter of minutes instead of hours.
- ☆ It will do the work of two average size filters with fewer pumps . . . less piping . . . less maintenance . . . lower labor cost.
- ☆ No cake disposal problem with a Niagara Horizontal Filter. Just tap or shake the leaves and dry cake drops into hopper.
- ☆ Hydraulically operated quick-opening cover standard on Niagara Horizontal Filters and is available as an extra on Vertical Filters.
- ☆ Every Niagara Filter is constructed in accordance with ASME requirements. Pressures up to 75 PSI are standard; can be built for pressures up to 280 PSI.
- ☆ Can be made of steel, stainless steel, nickel, monel, or other corrosion resistant materials; with rubber or plastic linings; and steel jacketed or insulated.

See what we mean? The savings in time and money will quickly pay for this modern equipment. And the same is true of Niagara Vertical Filters. That's the story you'll get from hundreds of users all over the country.

Want more details? Just clip and mail the coupon. No obligation.

Niagara FILTERS

A DIVISION OF

American Machine and Metals, Inc.

DEPT. CP255, EAST MOLINE, ILLINOIS

☐ Send catalog No. NC-1-53 ☐ Have representative call

Name and Title_____

Company_____

Address_____

City_____ Zone____ State_____

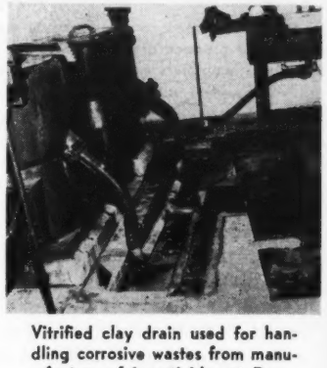
Specialists in Liquid–Solids Separation

Joining method for drains saves 50% in labor costs at Dow Chemical . . .

vitrified clay resists highly corrosive wastes

Specially designed vitrified clay drains, successfully used for handling corrosive wastes at Dow Chemical Company, Midland, Mich., are installed by a procedure which has saved 50% in labor costs over previous installation methods.

Crews were able to install 18 feet of the permanent gutter in 28 hours by the recently developed technique.



Vitrified clay drain used for handling corrosive wastes from manufacture of insecticides at Dow

After trench has been prepared to the desired depth, stakes are driven into trench bedding. Crossbars to support each end of channel pipe are then wired to the stakes to maintain a correct grade line for outfall. Three-foot lengths of the drain are placed atop crossbars. Second crossbar is placed across top to prevent channel pipe from floating when concrete is poured.

Joint is wrapped with two half sections of ⅜" thick Saran rubber in a 3" width. Ends of the two Saran sections are butted together on under side. These two sections are then wrapped under a single 3" width band of ⅜" thick Saran dusted with soapstone. The double thickness of Saran is wrapped with

For more information on product at left, specify CP 4902 . . . see information request blank opposite last page.

a light wire to prevent slippage as concrete fill is poured to top of gutter tile.

Concrete is allowed to set for 12 hours. Half sections of Saran are pulled out and then the single strip removed, creating a ¾" cavity around joint. After concrete fill has dried, acid-proof cement is forced into cavity to complete joint and drains are ready for use.

(Chemi-Drain channel pipe is manufactured by The Logan Clay Products Co., Dept. CP, Box 698A, Logan, Ohio . . . or reader may simply check CP 4903 on convenient Reader Service slip located opposite last page.)

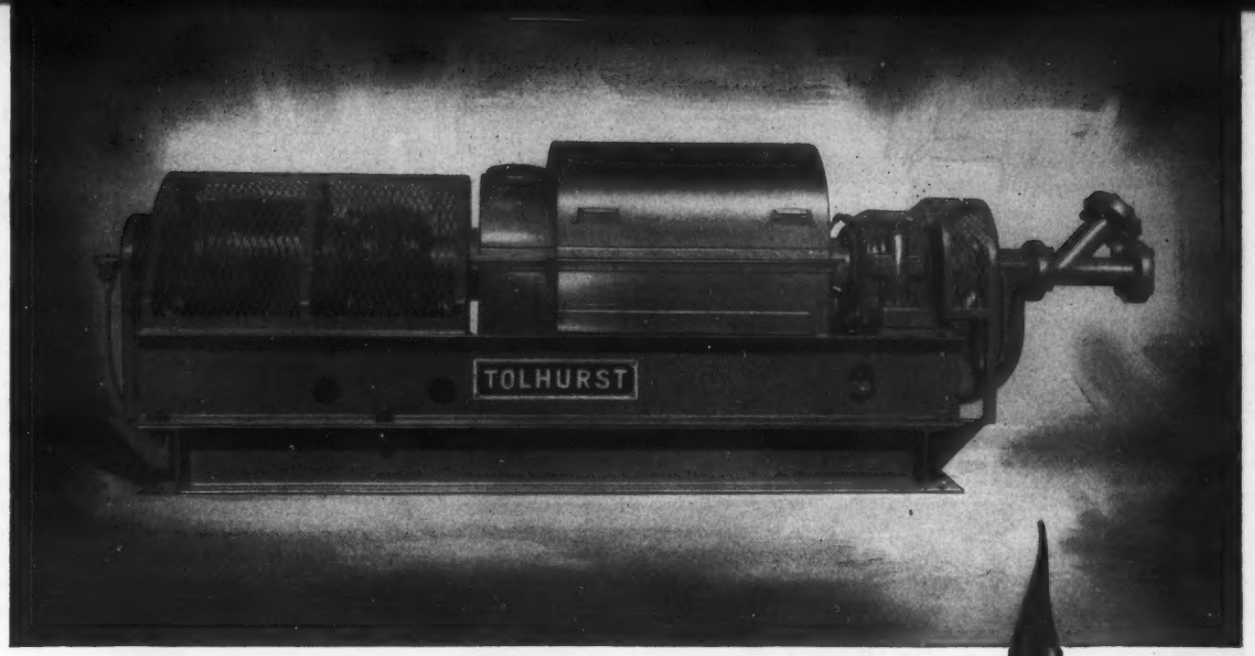
Quick, accurate method for determining oil in tung products

Oil content of wet or dry tung fruit, tung press cake, or filter cake can be rapidly and accurately determined by improved analytical method. Results are obtained within half an hour and are in good agreement with those obtained by 4-hour extraction with petroleum ether (this is the official method of American Oil Chemists Society).

Here's the procedure: Finely ground sample of tung material is mixed for 10 minutes in twice its weight of petroleum naphtha. The oil solution is filtered off, and its specific gravity determined. Oil content is estimated, either by reference to specific gravity vs percentage tung oil tables or to specially prepared curves.

(Analytical procedure described above was developed by R. S. McKinney and R. L. Holmes at US Tung Laboratory, Southern Utilization Research Branch, United States Department of Agriculture, Department CP, Bogalusa, Louisiana.)

For more information on product at right, specify CP 4904 . . . see information request blank opposite last page.



NOW... a continuous centrifugal that's really flexible

What beach speed do you require for most efficient centrifuging of your product? Whatever it may be, it's yours . . . instantly . . . with the new Tolhurst "Maxi-Flex" Continuous Centrifugal. For beach speeds can be changed at a moment's notice . . . set for any rate from 0 to 300 inches per minute. Likewise it requires only a simple adjustment to get any one of seven different pool depths. And you are always certain of the proper settling rate for maximum efficiency for you have available a force field which can be varied up to almost 2000 times gravity.

If you are running continuously on a single product it's a simple matter to make any adjustments needed to take care of process fluctuations or variations in technique. Or, if your operation calls for centrifuging several different materials intermittently, you merely adjust the beach speed and pool depths to suit each run. It's as easy as that. And, since the feed chambers are self-cleaning, the change-over from one product to another is quick and easy, resulting in minimum downtime.

It's easy to see why "Maxi-Flex" is the most flexible Continuous on the market today. It's designed for long service, too, with heavy-duty ball and roller bearings throughout. And "Maxi-Flex" can be built of any alloy which can be fabricated by normal shop methods.

Would you like to test it?

Perhaps your operation is such that you'd like to test a Tolhurst "Maxi-Flex" in your own plant. Or we'll gladly test samples of your material in our laboratory. And Tolhurst engineers and field representatives are always available for consultation. For full details, just clip and mail the coupon. No obligation.

Tolhurst CENTRIFUGALS
A DIVISION OF
American Machine and Metals, Inc.
DEPT. CP255, EAST MOLINE, ILLINOIS

YES . . . we'd like to know more about the Tolhurst "Maxi-Flex" Continuous Centrifugal for _____ (product or operation)

☐ Send Bulletin TC-10-53 ☐ Have representative call

Name and Title _____

Company _____

Address _____

City _____ Zone _____ State _____

Specialists in Liquid-Solids Separation

Tube Selection Cannot be Reduced to a Formula

—even a complicated one

Selection of the proper grade of stainless steel for a particular application is a relatively complex problem and involves manufacturing, metallurgical, chemical and economic considerations. Although it is complex it has been made easier by industrial research. Data accumulated through years of research and experience gained in helping to solve varied application problems are now available to guide the user in the solution of his present problems.

It is practically impossible to list all the media in which stainless steels will resist corrosion. It is even more difficult to enumerate all the conditions under which the stainless steels will resist effectively the corrosive effects of such media. Frequently, a relatively minor contaminant, when combined with the main reagent, will cause a more detrimental corrosive action than the latter by itself. This is particularly true of iron salts which, in the presence of chlorides, often prove to be a very potent corrodent, producing pitting.

It is always advisable to test a sample under actual operating conditions, especially before extensive untried installations are made. Proper tube selection starts with expert opinion, available to you through Mr. Tubes, your nearby B&W Tube Representative. There is no substitute for the kind of experience with pressure tubing problems you'll find at B&W. Ask Mr. Tubes for help in matching tubes to jobs.

THE BABCOCK & WILCOX COMPANY
TUBULAR PRODUCTS DIVISION
Beaver Falls, Pa.—Seamless Tubing; Welded Stainless Steel Tubing
Alliance, Ohio—Welded Carbon Steel Tubing

B&W SEAMLESS and WELDED TUBES

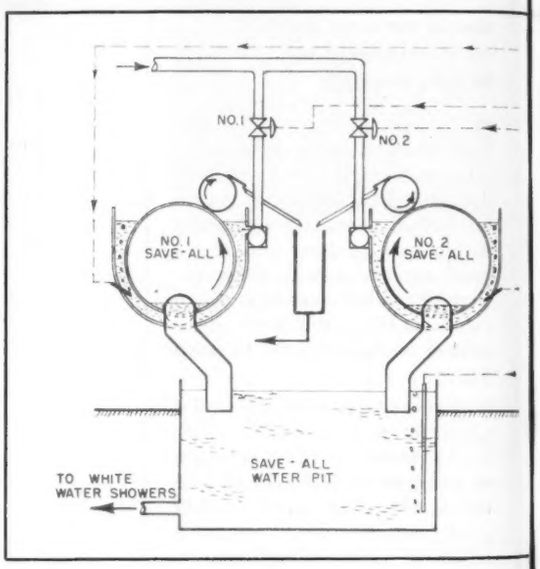
TA-4061(P)

When inquiring check CP 4905 opposite last page

Papermaker stretches water — 400,000 gal does work of 1,000,000 . . .

automatic level control helps avoid waste, maintains recovery rate to meet demand

Problem: Papermills have been operating at the present site of Schmidt & Ault in York, Pa., since 1798. Paper capacity has long outgrown water supply and, as in most papermills, operations now call for recirculating process water. About 300 tons of paper and paperboard are produced every day. Since each ton requires roughly 35,000 gallons of water, consumption should run close to 1,000,000 gallons a day.



Recirculation cuts this figure to 400,000 gallons. But in order to do this, tricky manual control was required. Operator had to make periodic inspections and adjustments, yet always had to be ready to change valve openings. Even vigilant operators could not always adjust input to recovery units fast enough to catch up with sudden increases in demand.

Solution: Dip tubes were installed at three key points. One bubbler senses level in save-all pit — a reservoir for reclaimed water. One bubbler was also installed in each of two save-all filters supplying this pit.

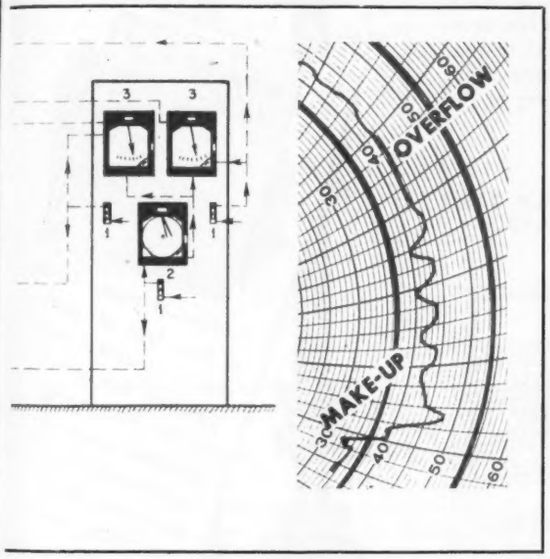
Depth of water in pit is recorded on direct-reading chart of controller. Output of this controller adjusts set point of each of other two controllers.

This action makes water level, hence input, to save-alls responsive to amount of reclaimed water on hand. Whenever level in save-alls differs from set point of save-all controllers, valve positions of input valves are changed. Thus, flow of water and pulp into each save-all is governed by 1) demand in pit and 2) demand in the save-all itself.

Dip tube in the pit is suspended 12″ above zero level. Control point is about 4′6″ above zero level. Range of the instrument is adjustable over 8′ of depth.

Stops are placed in controllers of the save-alls so that valves can never close completely. If water demand from pit became very low, this would mean a slight waste in overflow unless pit overflow was by-passed to another system. But trickle of water is sufficient to keep screens from getting clogged. Stops are changed, if necessary, as a screwdriver adjustment. Controlling range of level in save-all is 50″.

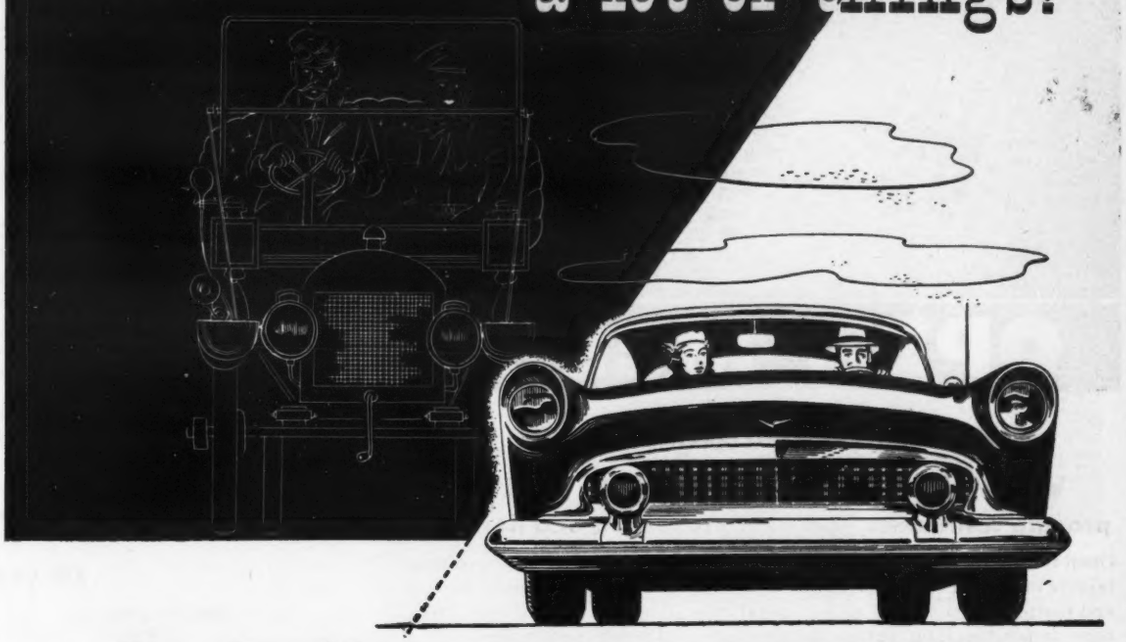
Results: Since control is maintained automatically regardless of demand, operator can work at other duties. Sudden demands seldom deplete supply. Maximum water efficiency can be attained. As shown in closeup of portion of record, controllers quickly place operation on a "no make-up" basis when save-all unit is started.



Three dip tubes control water levels in both save-all filters and in pit. Closeup of record portion (right) shows how instruments brought system under control after startup. Note that once under control, neither limit (make-up or overflow) was reached

(Level control system was engineered by Fischer & Porter Co., Dept. CP, 7250 Jacksonville Rd., Hatboro, Pa. . . . or for more information reader may simply check CP 4906 on convenient Reader Service slip located opposite last page.)

50 Years have changed a lot of things!



...including DUST CONTROL

Licensed by H. J. Hersey, Jr.

Diagram of operating design of filter tube.
(Available in multiples of 4, 8, 12, 16 and 32 tubes)

OUTSTANDING DAY REVERSE JET FILTER ADVANTAGES

- 99.99+% Filtering Efficiency
- Up to 5 Times Higher Filtering Rates
- 100 per cent of Equipment Investment Is in Operation at All Times
- Smaller Size with Higher Capacity Saves Valuable Plant Space

Handles 5 times more dust laden air per square foot of cloth than conventional dust filters.

The automobile has changed America's living habits and the DAY High Pressure Reverse Jet Filter has changed American industries' dust control methods. To match the challenge of changing times and changing needs DAY leadership revolutionized the control of dust by utilizing the Hersey principle of filter cloth cleaning with HIGH PRESSURE REVERSE JET AIR. This advanced type of filter handles FIVE TIMES MORE DUST LADEN AIR per square foot of filter cloth than conventional filters. This is the most important improvement in dust filtering in 50 years.

Modern manufacturing methods demand modern dust control methods. There is nothing that will match the high on-the-job efficiency provided by DAY filters. It is a proven fact that one DAY filter recommends another. DAY High Pressure Reverse Jet filtering has been used by leading companies for more than 5 years. 87% of DAY filter users have ordered additional DAY Reverse Jet Filters. For maximum filtering results from a minimum filter investment write for complete facts. DAY gives you tremendous savings in valuable plant space, installation and maintenance costs.

Write toDAY for FREE Bulletin 528-R, about America's most advanced dust filter.

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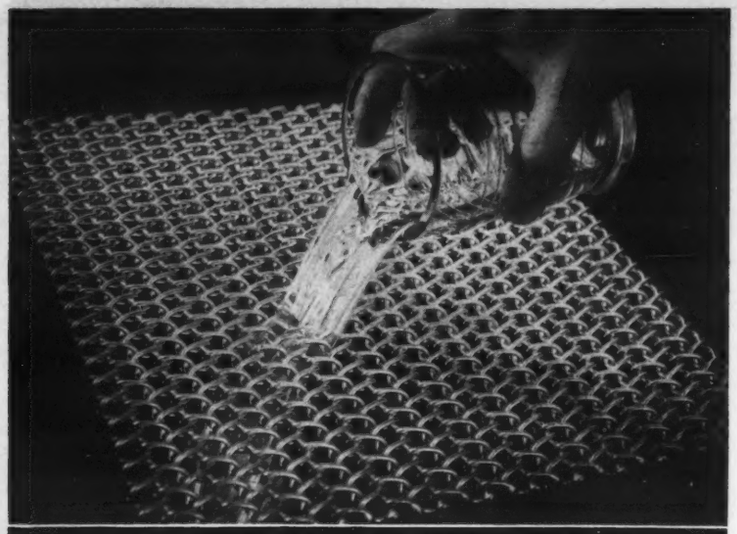
STOP AIR POLLUTION with DAY DUST CONTROL

When inquiring check CP 4907 opposite last page



OPEN MESH!

Cambridge

WOVEN WIRE CONVEYOR BELTS

provide continuous, low-cost processing and handling

Open mesh construction lets heat and gases circulate freely, cannot trap liquids or spilled solids . . . provides uniform washing, draining, drying and waste-free packaging at controlled rates of speed. Moving belt eliminates batch handling, cuts costs, provides continuous production.

All-metal Cambridge Woven Wire Conveyor Belts are corrosion resistant and impervious to damage from constant operation at temperatures up to 2100° F . . . have no seams, lacers or fasteners to snag packages or wear unevenly, no localized weakening. Open mesh permits easy salvage of spilled materials.

No matter how you look at it, CAMBRIDGE Woven Wire Conveyor Belts are invaluable aids to AUTOMATION . . . eliminate profit-stealing batch and hand operations. They are made in any size, mesh or weave, and from any metal or alloy. Special raised edges or cross-mounted flights to hold your product during movement are available.

BAGGED CEMENT... Spillage sifts through open mesh of belt — salvaged as bagged product moves on its way with minimum handling.

Call in your Cambridge Field Engineer to discuss how you can cut processing costs by continuous operation. You can rely on his advice. Write direct or look under "BELTING, Mechanical" in your classified telephone book.

ASK FOR FREE 130-PAGE REFERENCE MANUAL illustrating and describing woven wire conveyor belts. Gives mesh specifications, design information and metallurgical data.

The Cambridge Wire Cloth Co.

WIRE CLOTH | METAL CONVEYOR BELTS | SPECIAL METAL FABRICATIONS

Department F
Cambridge 2, Maryland

OFFICES IN LEADING INDUSTRIAL AREAS

When inquiring check CP 4908 opposite last page

NEW SOLUTIONS of processing problems

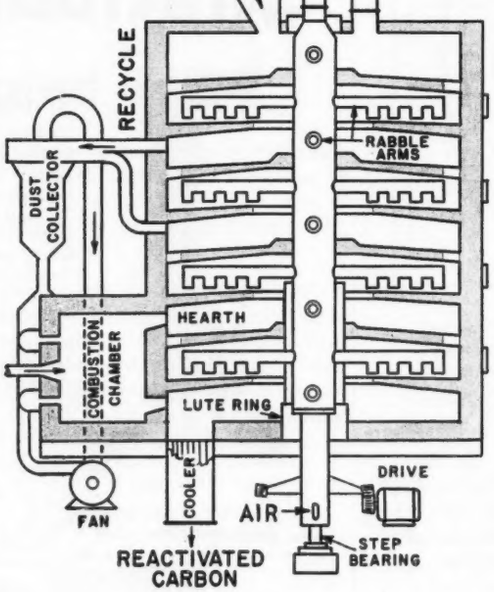
Activated carbon is revivified to original decolorizing efficiency . . .

six-hearth Herreshoff furnace oxidizes impurities in almost neutral atmosphere at 1800°F

Problem: When Clinton Foods Inc., Clinton, Iowa, replaced bone char with specially refined granular activated carbon in the decolorizing of refined dextrose hydrate, called Clintose®, (see article in December 1954 CHEMICAL PROCESSING, pages 20-21) they required a system to revivify the carbon to original efficiency.

Former method was to return the carbon to manufacturer, but this involved additional expenditures and tied up large quantities of carbon. Vertical tube kilns formerly used to regenerate bone char couldn't be used, as not only was control lacking, but kilns could not maintain the required revivification temperature of 1800°F.

Solution: A 14'3" diameter six-hearth Nichols Herreshoff char furnace was installed two years ago. Under close instrument and laboratory control, color bodies on the granular carbon are oxidized in the almost neutral atmosphere of the



NICHOLS HERRESHOFF FURNACE

Carbon feed is spread over the large area of furnace hearth and is continuously turned over by rabble arms with rakes, giving intimate and extensive gas-solid contact

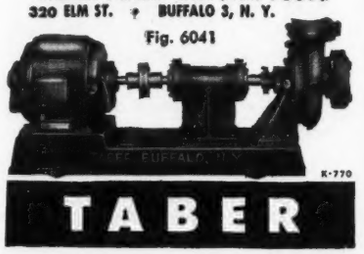
PUMP STUFFING BOXES

INFORMATION suggesting solution of common stuffing box difficulties; available in newly revised BULLETIN S-147

Fig. 19,488
STUFFING BOX.... THE Vital PART OF ANY PUMP
TABER
Number of rings, depth of box, type of packing . . . chemical and physical properties of the fluid being pumped, speed of shaft and other pertinent usable facts are in this Bulletin.

WRITE on business stationery for your copy of Bulletin S-147.

TABER PUMP CO. (Est. 1859)
320 ELM ST. • BUFFALO 3, N. Y.



TABER

When inquiring check CP 4909 opposite last page

furnace at temperatures up to 1800°F. Approximately 25,000 pounds of carbon are revivified each day. Handling is accomplished by a conveyor system. Control instruments for furnace are located in a separate room, kept under positive pressure.

Refractory nature of the granular carbon makes continuous thermal regeneration particularly attractive. Temperature of carbon is raised rapidly to 1500°F in the direct-fired rake-type furnace. This removes volatile impurities which are carried off in the combination gas currents; presence of moisture aids this volatilization. Color impurities on the carbon are oxidized in an almost neutral atmosphere of air, steam, and flue gases at 1800°F. Furnace operates around the clock.

Results: Nichols Herreshoff char furnace requires about one-quarter the space of the vertical tube kilns used for the bone char. High-temperature furnace reactivation penetrates the carbon, thus opening the finer pores more completely and with less external attrition and internal softening of the carbon. Activated carbon is returned to its original decolorizing efficiency.

Maintenance on furnace is low, as have been operating costs. Furnace hasn't been shut down since it was started two years ago.

(Nichols Herreshoff furnace was licensed and installed by Nichols Engineering and Research Corp., Dept. CP, 70 Pine St., New York 5, N. Y. . . . or for more information check CP 4910 on handy form opposite last page.)

Corn starch separated, purified in minutes instead of hours

Continuous process for corn starch separation and purification is discussed in two-page folder. Flow diagram shows system with five centrifugal separators which can replace conventional set-up requiring 20 times as much factory floor space. Elapsed process time from feed to final product is minutes instead of hours.

Flow Diagram 26-20 is issued by Merco Centrifugal Company, Dept. CP, 150 Green Street, San Francisco 11, California. When inquiring specify CP 4911 opposite last page.

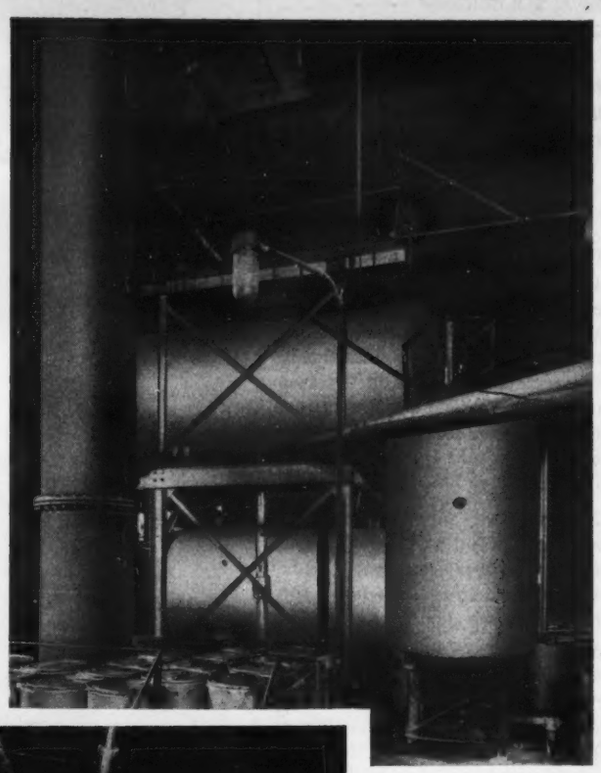
✦ ✦ ✦

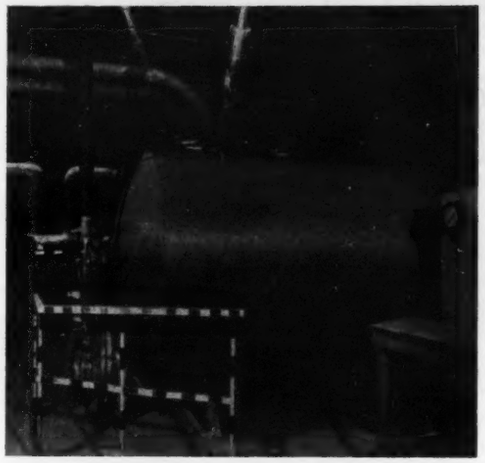
Weather controls windows

Timing and other devices control windows developed by Micro-Moisture Controls, Inc., of Florida. Windows can be set to open just after you retire — and close before you rise in the morning. Or, changes in temperature will perform the opening and closing operations, as will rain. An automatic built-in alarm foils burglars.

How corrosion is controlled

in making a famous Chlorinated Organic Weed-Killer





Pure 2,4-D is separated from underchlorinated and overchlorinated product in the solid Nickel fractionating column shown above. All the cuts are received in nickel or Nickel-Clad Steel tanks as well, to protect product purity.

A purer, drier dichlorophenol was the result when this Nickel still was installed at Pittsburgh Coke & Chemical to resist corrosion by chlorine and hydrochloric acid.

When Pittsburgh Coke & Chemical Company embarked on the manufacture of the herbicide 2,4-D some years ago, they were confronted by some formidable corrosion and contamination problems.

Making 2,4-D calls for the chlorination of phenol to dichlorophenol, then reacting this with monochloracetic acid to form the 2,4-D acid.

Small amounts of hydrochloric acid form during chlorination, and, together with unreacted chlorine, constitute a corrosion thread which persists through the distillation stage. And beyond the fractionation stage, even small amounts of corrosion products, if allowed to form, will affect color and purity.

When operations were still in the pilot plant, trouble was experienced with corrosion of certain equipment items. Inco's Corrosion Engineers were called in and corrosion tests were performed at various equipment sites. As a result of the tests, nickel pipe and fittings were installed in the system and eventually the use of Nickel and Nickel-Clad Steel was extended to such important items as the still, steam coils, fractionating tower, condenser and storage vessels used in making and handling dichlorophenol.

The tank for weighing pure dichlorophenol and such items as the reactor for making 2,4-D as well as stripping column, centrifuge and dryer are made of another high-nickel alloy, Monel. Most of the equipment has been in successful operation for four years.

Do you have a corrosion or contamination problem connected with a chlorination operation? If so, Inco Nickel or a high-nickel alloy may very well be the answer. At any rate, write to Inco's Corrosion Engineering Section, stating your problem in detail. They will be glad to advise you without cost or obligation.

THE INTERNATIONAL NICKEL COMPANY, INC.
67 Wall Street New York 5, N. Y.

INCO TRADE MARK **Nickel Alloys**

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INCONEL "W"® • INCOLOY® • NIMONIC® Alloys
NICKEL • LOW CARBON NICKEL • DURANICKEL®

When inquiring check CP 4912 opposite last page

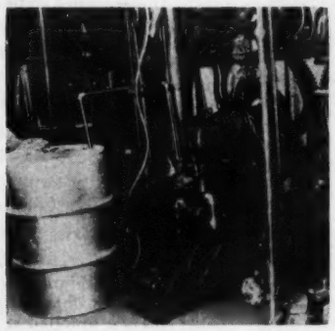
Impregnant seals leaks in drying drum, saves time, labor . . .

unit fixed in place, shutdown only for short time

Problem: Leaky 48-inch diameter drying drum was threatening to shut down production at Felt Process Company, Jamaica Plain, Mass. Removing it for repairs was difficult — two other drums and supporting members would have to be moved first. Job would be time-consuming and costly.

Machines are used for processing fiber, wood pulp, and rubber mixtures. These are later made into stiff boards and used for making safety-shoe caps.

Solution: Exact location of all leaks were found with steam. Vacuum was applied and a metal-sealing impregnant was drawn into the unit. After sufficient



Impregnant being drawn into leaky drying drum from barrel (left)

amount had been charged, steam pressure was again applied to force impregnant through leaks.

After all leaks had been sealed, remaining solution was drained. Unit was washed, steamed, dried, and rechecked for leaks.

Results: No leaks were found and machine went back into operation. Costly moving of equipment was avoided and shut down was kept to a minimum. By filling up even microscopic pores, impregnant also provides protection against corrosion in heavy service.

2 Stock Answers for T

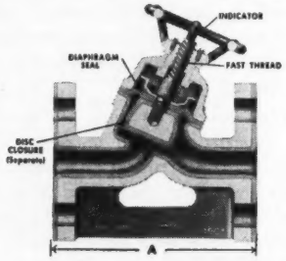
Farris X-V Series

This versatile, dependable, economically-priced hand valve is equally at home in corrosion, abrasion, vacuum or general service—wherever positive action is needed. The X-V Series disc—for positive closure—and diaphragm—for positive sealing—work independently, with only the disc exposed to pressure in the closed position, substantially increasing diaphragm life, lowering torque and providing unsurpassed vacuum service . . . No other valve does such a complete job at so little cost!

Write for Bulletin FL-154

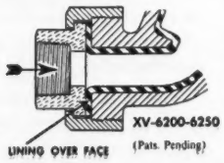
DISC for positive closure

DIAPHRAGM for positive sealing



NEW

Corrosion Resistant Union Ends



X-V Series Design Features

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- Only Disc Area Exposed to High Vacuum in Closed Position
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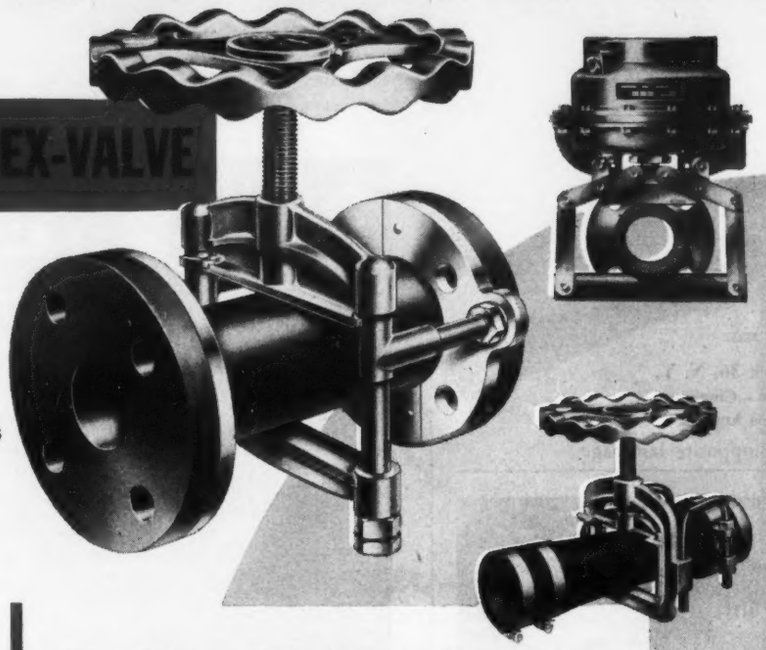
- Low Hand-Wheel Torque... Easy to Operate
- Available in Lined or Unlined Models...With Corrosion Resistant Union Ends.

Tough Valve Problems

Farris Pinch-type FLEX-VALVE



No other valve controls the flow of hard-to-handle corrosive and abrasive materials with the efficiency and reliability of the Farris Pinch-Type FLEX-VALVE . . . because FLEX-VALVE cannot plug! This is the simplest valve made—only two components—employing the fundamental principle of pinching off the rugged, flexible valve body. Case histories show batteries of these valves in severe service for more than 20 years—and still going strong!

For complete information write for Catalog FL-382

YOUR MONEY BACK IF IT PLUGS!

Flex-Valve's Exclusive Advantages

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- Full Pipe Capacity
- Maintenance Free
- Bubble Air-Tight
- Low Replacement Cost
- No Obstructions, Pockets or Internal Parts
- Available in Rubber, Neoprene, Butyl, Buna-N, Buna-S, Food Stock and Special Compounds.
- Air or Hand-operated Types

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FARRIS HYDROSEAL CORP. • FARRIS HYDROTORQUE CORP. • FARRIS PICKERING GOVERNOR CO.

(Metaseal Process is development of American Metaseal Manufacturing Corporation, Dept. CP, 607 65th Street, West New York, N. J. . . . or for more information check CP 4913 on handy form opposite last page.)

Plant cuts labor costs 25% with ultrasonic metal cleaning . . .

high-frequency sound waves scrub parts clean

Labor costs have been reduced over 25 per cent by use of a fully-conveyorized ultrasonic metal-cleaning machine in the shaver plant of Schick, Inc., Stamford, Connecticut. Installed in April 1954, the unit assures high-quality work, has made inspection easier, and has reduced amount of poor work in subsequent operations.

In the process, electrical energy is converted into high-frequency sound waves which "scrub" parts clean. Using a trough-type barium titanate transducer directly immersed in a degreasing solvent, particle acceleration of 1½ million times force of gravity is achieved in focal region.

Hand brushing prior to inspection has been eliminated. Process also replaces wiping operations for removing soils from cavities, shallow indentations, small holes, and other precision-surfaces.

Cleaning method can also be applied to non-absorbent materials such as glassware and molded products.

(Soniclean machines are product of Detrex Corporation, Dept. CP, Box 501, 14331 Woodrow Wilson, Detroit 32, Michigan . . . or for more information reader may simply check CP 4914 on handy form opposite last page.)

For more information on product at left, specify CP 4915 . . . see information request blank opposite last page.

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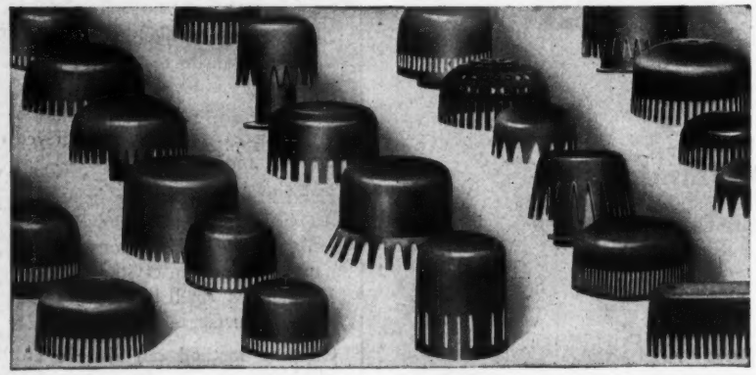
When inquiring check CP 4916 opposite last page



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BUBBLE CAP BULLETIN 21

Largest Compilation of Engineering Data.

Lists 200 Styles Furnished Without Die Cost.

This standard reference contains complete specification information for over 200 standard styles of bubble caps and risers. Also drawings for use in determining methods of tray assembly. All styles listed in Bulletin 21 are furnished promptly, without die cost, and in any alloy to meet your coking or corrosion problems. Special caps gladly designed; write as to your needs.

THE PRESSED STEEL CO., 709 N. Penna. Ave., Wilkes-Barre, Pa.

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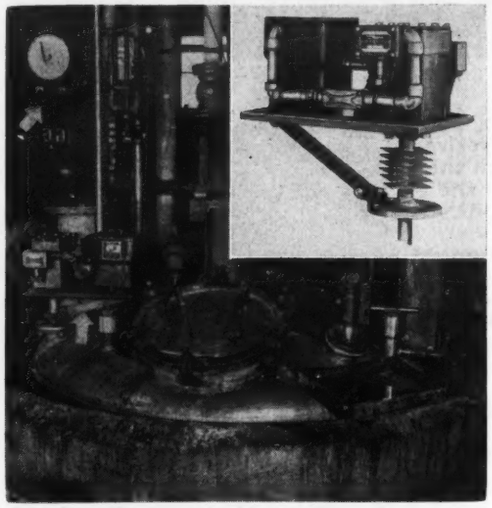
When inquiring check CP 4917 opposite last page

NEW SOLUTIONS of processing problems

Armstrong Paint saves $5000 per yr with use of recording viscometer in resin manufacture . . .

useful tool has prevented several gels, improved uniformity of product

Problem: Spot sampling method of determining viscosities in resin manufacture at Armstrong Paint & Varnish Works, Chicago, Illinois, was too slow for proper control of process. Occasionally the viscosity of a batch would rise more rapidly than anticipated, resulting in the formation of a gel. Each time this happened, a kettle was tied up for two days, delaying production and delivery date.



Viscometer in service on resin kettle, recorder appearing at upper left, with measuring element below (also shown in inset)

Previous sampling procedure involved taking a sample from a vessel by hand, thinning it to proper solids content, cooling, and comparing with Gardner-Holdt standards by the bubble method. This took a minimum of 10 minutes — 15 to 20 minutes for higher viscosities. To this must be added the 15 minutes required to dump a batch. During all of this period, the viscosity was increasing.

Solution: About three years ago, based on results of a cooperative testing program with other paint manufacturers, company made the decision to use viscometer shown in accompanying photograph. Instrument is installed on a Groen gas-fired kettle, used for polymerizing resin at about 440°F. Viscometer consists of a recorder and a measuring element. Sample is drawn into device by means of a piston.

Every three minutes, piston is slowly raised by motor cam mechanism, then allowed to drop by gravity. A sample of liquid whose viscosity is to be measured is drawn in through orifices as the

THIS PLA-TANK® HOOD SAVED ITS COST IN A YEAR

The PLA-TANK Hood shown above has been in continuous use at General Electric's small aircraft engine department in West Lynn, Mass., for over a year. Reports indicate that it is still as good as when originally installed, is already credited with saving its entire cost since no previously used material had lasted over a year.

The tank is used for etching stainless steel billets; solutions used are aqua regia at room temperature and a 50% solution of muriatic acid at 180°F. PLA-TANK has successfully withstood these fumes, where other materials failed.

PLA-TANK products are daily solving problems of all types in the chemical and electroplating fields. They replace or outlast stainless steel, lead and ceramic linings, plywood coated with corrosion preventatives, phenolic plastics and asbestos cement board structures in many applications.

PLA-TANK, molded from long-life, resin-bonded glass fibre laminate, is now resistant to a wider variety of fumes and temperatures than ever before. PLA-TANK is light weight, easy to install, competitively priced.

Let us help you solve your problems the modern way — with PLA-TANK. Write today for free data sheets. P-21

THE Chemical CORPORATION
63 Waltham Ave., Springfield 9, Mass.

When inquiring check CP 4918 opposite last page

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TUBE-TURN* WELDING TEES are drawn from seamless tubing to a barrel shape. This, and other design features produce high strength—averaging over 25% more than required by applicable standards.

Specify TUBE-TURN Welding Fittings and Flanges for extra values: superior products, the exact fitting or flange you need from our complete line, outstanding engineering service. Call your nearby Tube Turns' Distributor. He is at your service!

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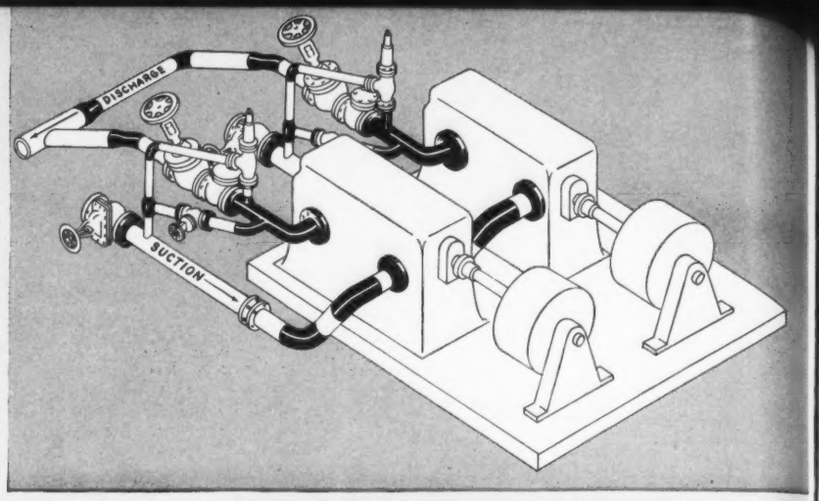
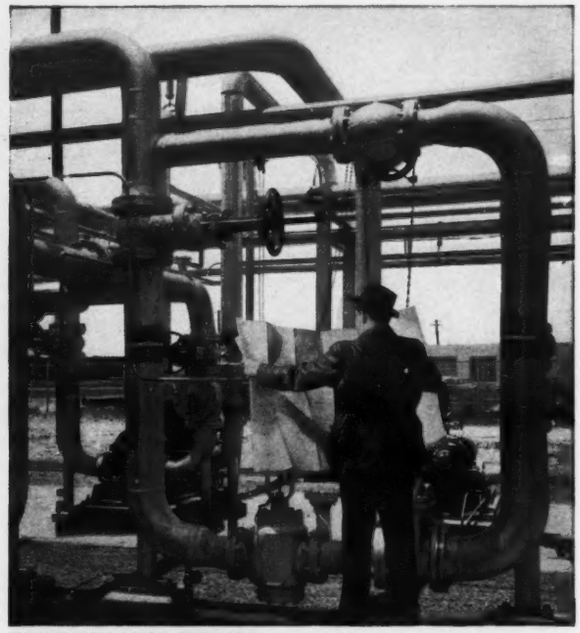


ENGINEERING SERVICE—Tube Turns' Engineering Service can help you on your piping projects. For example: Diagram above shows an application where TUBE-TURN* Welding Fittings and Flanges simplified the design and erection of pump piping. They save time, save space, and make the piping permanently leakproof and reliable. Ask your Tube Turns' Distributor to give you the pump piping recommendations of Engineering Service.



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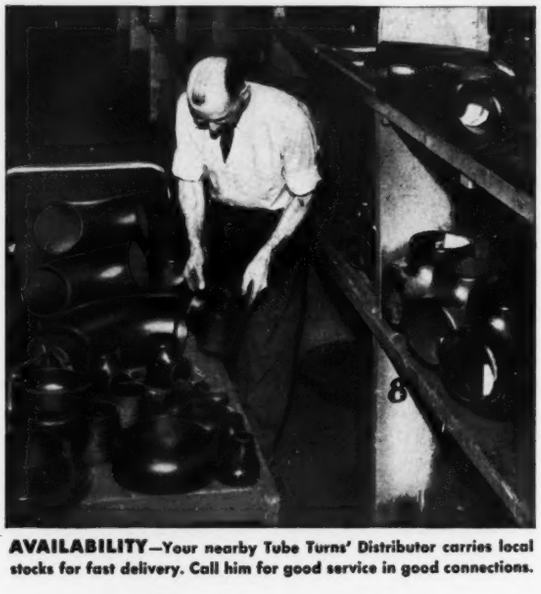

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piston is raised and expelled when the piston is dropped. Time required for piston to drop is a measure of the viscosity, and this measurement is electrically transmitted to an associated round chart recorder.

Each time viscosity is measured, pen makes one stroke on recorder, strokes becoming longer as viscosity increases. Plant continues to run some samples by the Gardner-Holdt method on each batch, results of which are marked on recorder chart at points corresponding to pen stroke made when sample was taken. Operator watches chart and dumps batch when required viscosity has been reached.

Results: Recording viscometer has prevented about three gels per year since it was placed in service, resulting in a saving of about $5000 per year. Recently, unit enabled plant to quickly detect the abnormal performance of a batch of varnish which was too low in viscosity due to insufficient blowing with CO_2.

Section of chart for one resin batch, showing how Gardner-Holdt viscosities are marked opposite equivalent pen strokes

Although instrument is not a cure-all, it has been found to be a useful tool. Important advantage is that a batch cannot "take the operator by surprise" (get out of hand). Uniformity of product has been improved. Instrument provides closer control of viscosity, particularly when same formulation is used for several batches. Viscosity measurements do not drift from batch to batch.

Viscometer is cleaned on an average of about every four days, kettle being cleaned at the same time. Occasionally a piece of dirt lodges in instrument, which must then be removed if accurate readings are to be maintained. However, this difficulty has been overcome by redesign of a later model of this instrument, according to report by the manufacturer of viscometer.

(Recording viscometer described above is product of Norcross Corporation, Department CP, 247 Newtonville Avenue, Newton 58, Massachusetts . . . or for more information reader may simply check CP 4919 on the convenient Reader Service slip which is located opposite last page.)

For more information on product at left, specify CP 4920 . . . see information request blank opposite last page.

Louisville Method

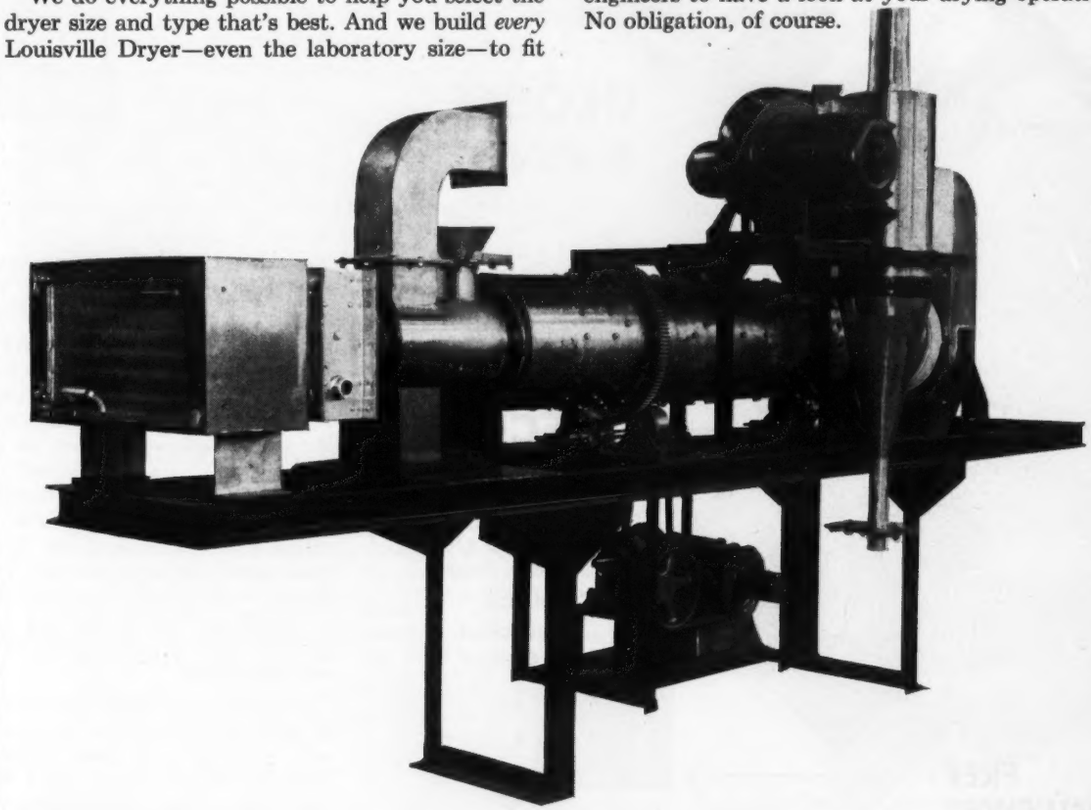
how **BIG** should a dryer be?

"Baby" Louisville Dryers do a man-sized production job for chemical firm

A large chemical firm has twice bought small, laboratory-size Louisville Dryers to serve as pilot plants for new materials. In both cases, their engineers were amazed to find the pilot dryers were producing sufficient quantities to supply the market!

We do everything possible to help you select the dryer size and type that's best. And we build *every* Louisville Dryer—even the laboratory size—to fit the job, and to give years of satisfactory performance at rock-bottom maintenance cost.

Let Louisville's 53 years of drying experience, spanning thousands of installations for all types of industry, work for you. Why not ask one of our engineers to have a look at your drying operation? No obligation, of course.



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OFFICES IN ALL PRINCIPAL CITIES

When inquiring check CP 4921 opposite last page

ACCO products

R-P&C BRONZE VALVES—125, 150, 200 AND 300 LB. PRESSURE CLASSES

GATES

Fig. 86 illustrated, rated for 125 lbs., has stationary stem, solid wedge, screwed ends. Other 125 lb. models with screwed bonnet, rising stem, solid wedge.

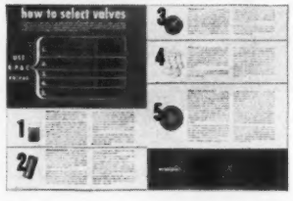
GLOBES & ANGLES

Fig. 1A Globe illustrated, rated 150 lbs. steam, 225 OWG, has renewable asbestos disc, union bonnet. Also furnished as Angle. Sizes ¼" to 3".

CHECKS

Fig. 198 illustrated, rated for 125 lbs. Other swing check valves in 150, 200, 300 lb. classes.

"Reliable Protection & Control"



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AMERICAN CHAIN & CABLE

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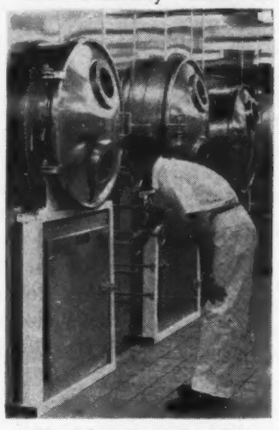
Better Values

When inquiring check CP 4922 opposite last page

Relative humidity in freeze-drying area for glandular extracts held at 20% by air conditioning system

Problem: At Armour and Company's Pharmaceutical Center, Kankakee, Illinois, close control of temperature and humidity must be maintained in the area where company's highly purified glandular extracts (named Acthar, Tryptar, Infiltrase, and others) are lyophilized, which is a process for drying in the frozen state. Because of the hygroscopic nature of the extracts, conditions must be kept at 75°F dry bulb and 20% RH.



Glandular extracts in water solution are frozen in vials at −70°F and placed in freeze drying unit

Solution: A 55-23 Hygrol air conditioning unit is installed in the plenum chamber above processing area. About 6700 cfm of air is circulated, 5/6 of which is recirculated air and 1/6 fresh air. A typical example: Outside air at 95°F dry bulb and 76°F wet bulb is mixed with about five times as much recirculated air (@ 75° DB, 20% RH). Mixture passes through a spray of Hygrol liquid, the absorbent. A cooling coil maintains the spray at the temperature necessary to obtain the required amount of moisture absorption. This also lowers the dry bulb temperature so the 75°F room temperature is maintained. On leaving the spray section, air passes over a steam reheat coil (which will heat the air during colder weather.) Conditioned air leaves the unit at 55° DB and 42% RH, which maintains the required conditions in dryer room and laboratories.

Conditioner can absorb a maximum of 79 pounds of water per hour from the mixture of outside and recirculated air. This moisture is removed from the Hygrol solution by a Model 5611 Hygrol Concentrator, which heats the solution by spraying it over a steam coil and evaporating excess moisture. Concentrator, which is located adjacent to Hygrol Conditioner, has a fan which takes in outside air and passes it through the spray chamber where the warm liquid gives up moisture to the air which is discharged to the outside. A heat exchanger between conditioner and concentrator cools concentrated Hygrol liquid going back to the conditioner and at the same time warms the liquid flowing from the conditioner to the concentrator, thus minimizing

BEE-ZEE

BEE-ZEE SCREENS

can be your best salesmen!

● In a market that's tough and getting tougher, your product must *prove* its quality every day to every customer. Bee-Zee Screens help you do this. They are precision spot welded of stainless steel... can be fitted to any screening equipment ...with rods *shaped* and *spaced* for maximum product quality. They are custom-designed for *your* operation —to separate and/or deliquefy with a precision and thoroughness your competitor can't beat!

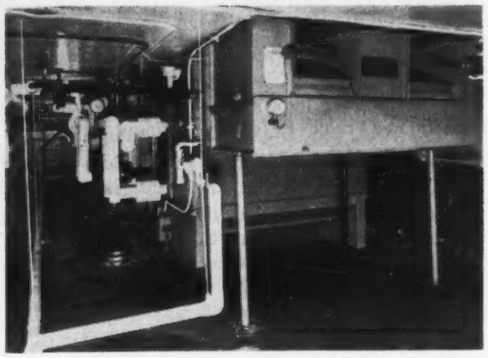
Phone, wire or write. We'll tell you the story of how Bee-Zee Screens *make you money.*

- **Tri-Rod for knife-like separation.**
- **Round Rod for long-lived accuracy.**
- **New Grizzly Rod combines the best features of round and tri-rod.**
- **New Grizzly Rod with protective skid rod guards against abrasive action without sacrificing efficiency or percentage of open area.**

CALL US COLLECT – Galesburg, Illinois, 4397

BIXBY-ZIMMER
Engineering Co.
725 Abingdon Street, Galesburg, Illinois

When inquiring check CP 4923 opposite last page



Air conditioning system in plenum chamber above unit keeps freeze-drying area at 75°F, 20% RH

both steam and refrigeration requirements.

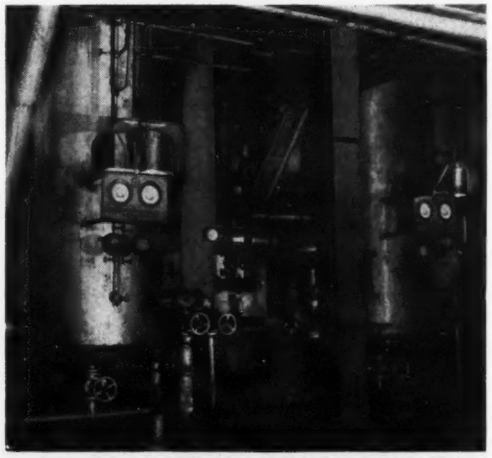
Results: Operation is continuous, and fully automatic, and has met the strict requirements satisfactorily. Conditioning system has been in service for over a year, and only maintenance required has been normal periodic clean-outs.

(Air conditioning system is a product of Niagara Blower Co., Dept. CP, 405 Lexington Ave., New York 17, N.Y. Check CP 4924 opposite last page.)

Automatically-controlled evaporator removes 44,000 lb of water per hr from concentrate syrups . . .

unit has required very little maintenance in four years of operation

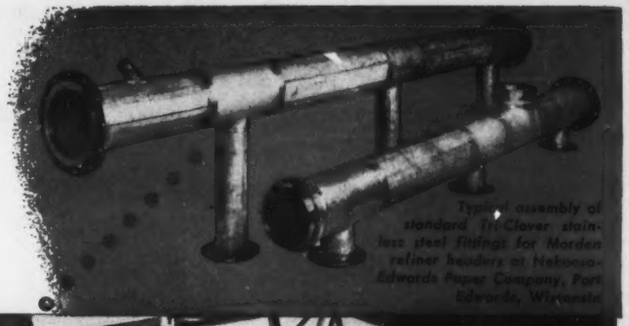
Problem: Former evaporator used for concentrating dextrose-bearing liquor and syrups at the Pekin, Ill. plant of Corn Products Refining Com-



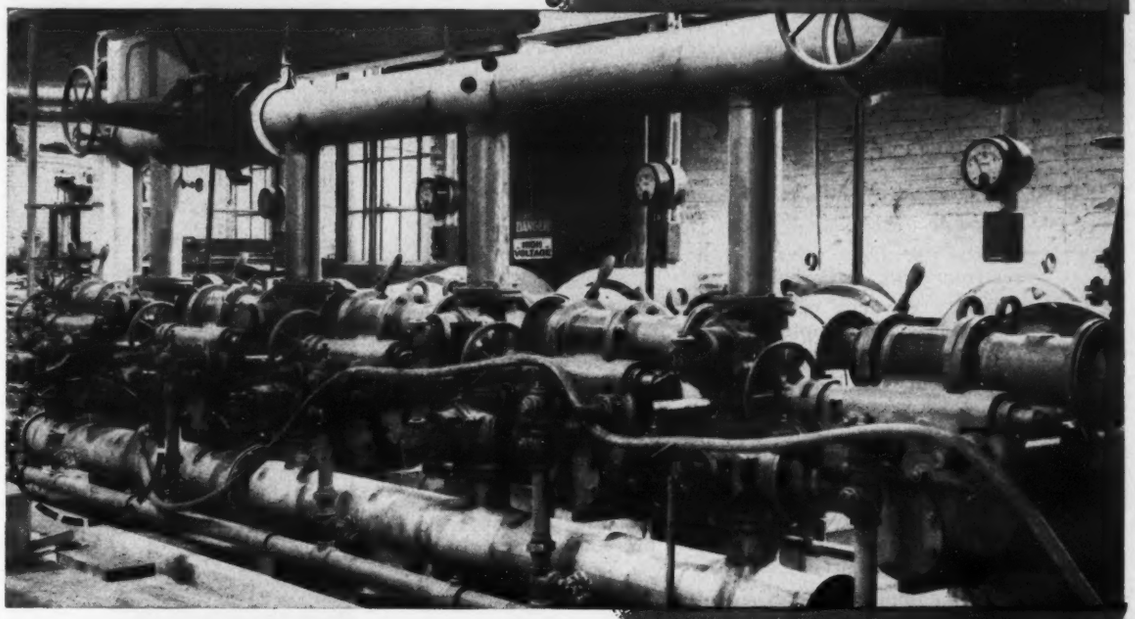
Two of the three effects are visible in photograph of evaporator in use at Corn Products Refining Company

(*Continued on next page*)

Save Time and Money on Corrosion-Resistant Lines . . .



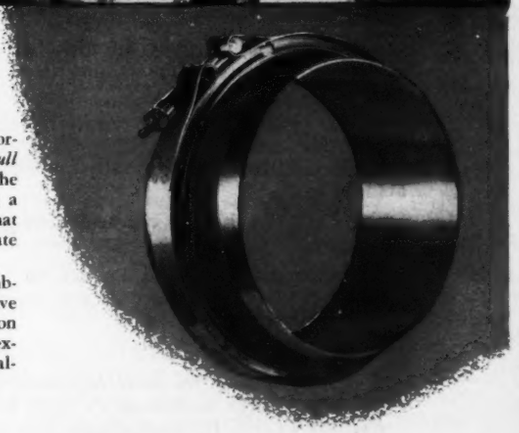
Typical assembly of standard Tri-Clover stainless steel fittings for Morden refiner headers at Nekoosa-Edwards Paper Company, Port Edwards, Wisconsin



. . . with TRI-CLOVER Stainless Steel Fittings

Among the most important factors governing the selection of corrosion-resistant fittings and piping are: (1) The assurance of *full* corrosion-resistance in the actual material; (2) the assurance that the manufacturer has had ample experience and ability in producing a full range of corrosion-resistant material; and (3) assurance that actual costs for installation will be as low as possible, commensurate with the quality of the finished assemblies.

When you specify *TRI-CLOVER* stainless steel fittings, pipe, tubing and pumps you can be *sure* that all of the above factors have been met . . . And you can be *sure* that you are getting *full* corrosion resistance in *every* fitting . . . thanks to Tri-Clover's specialized experience in solving corrosion-resistant piping problems for chemical-process industries from coast to coast.



STAINLESS STEEL CLAMP-TYPE CONICAL FITTINGS . . . requires only two simple ferrules and clamp to assure leak-tight joints thru the use of Teflon gaskets. Fast, simple assembly and disassembly—Just one of the complete range of Tri-Clover Stainless Steel fitting types to meet practically every corrosion-resistant piping requirement.

LADISH CO.
Tri-Clover Division
KENOSHA WISCONSIN

See your nearest TRI-CLOVER DISTRIBUTOR EXPORT DEPARTMENT, 8 So. Michigan Ave., Chicago 3, U.S.A.

When inquiring check CP 4925 opposite last page

TYGON IS TOPS

For Lining Tanks

Here's why... Here's how

TYGON's outstanding resistance to acids and alkalies permits its use in all the usual lining and covering jobs.

TYGON's unique resistance to oxidizing acids, oils, greases, and solvents makes possible its use in jobs other linings cannot handle.

TYGON's flexibility permits close conformance, resulting in a good bond, to all but the most intricately shaped equipment.

TYGON's resilience minimizes the possibility of damage from mechanical abuse.

TYGON's elasticity permits thermal contraction and expansion without rupture.

TYGON's abrasion resistance withstands the wearing action of thick slurries and dry or moist chemicals.

TYGON's negligible extractibility prevents contamination of the most sensitive solutions.

TYGON's white color (Compound No. TL-104B) permits full solution visibility—facilitates quality control — highlights impurities.

TYGON's high electrical resistivity prevents current losses in electrolytic action.

TYGON's smooth, non-porous surface makes for easier cleaning and greater solution flow.

TYGON's thermoplasticity permits the "heat-sealing" of seams to form continuous, one-piece, impermeable linings.

TYGON's selective solvent sensitivity eliminates the "need" for curing to obtain a strong bond — makes possible installations of virtually any size — simplifies field repairs.

TYGON's non-oxidizing characteristics give it a long service life.

And remember, Tygon linings can be installed by a licensed Tygon applicator near you—with major savings in time and money.

Write, right now, for more information! Ask for our new 12-page booklet on TYGON LININGS— Bulletin TL-526. It's packed with facts and figures.

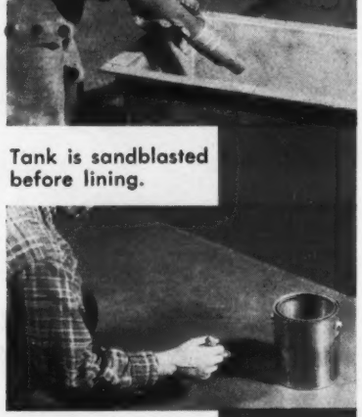
U. S. STONEWARE

AKRON 9, OHIO

PROCESS EQUIPMENT DIVISION

158-D

Tank is sandblasted before lining.



Special cements are used.

Thick TYGON sheeting is applied.

Joints are "strip-sealed."

Entire lining is "spark-tested."

When inquiring check CP 4926 opposite last page

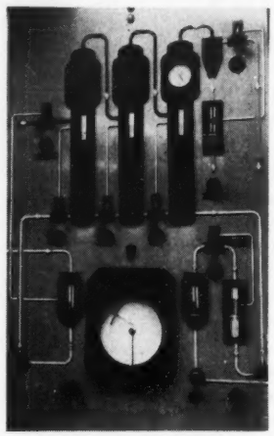
NEW SOLUTIONS of processing problems

(*Continued from preceding page*)

pany had insufficient capacity and required excessive maintenance. Liquor, which has a pH of about 4.8, comes from light carbon treating. It must be concentrated prior to carbon refining, treating.

Solution: In 1950 company installed a stainless steel triple effect evaporator with graphic panel for automatic control. This unit concentrates syrup from 20% dissolved solids to 55% at an evaporation rate of 44,000 lb of water per hour. It operates at a steam economy of 2.54 lb of water evaporated per lb of steam consumed.

Evaporator uses exhaust steam from turbines at 212°F and 0 to 5 psig. Steam enters first effect. Vapors from 1st effect heat 2nd effect and vapors from the 2nd heat the 3rd. Vapors from both the 2nd and 3rd effects pass through exchangers to heat incoming liquor.



Graphic panel board of completely automatically controlled evaporator

Liquor passes directly from 1st to 2nd to 3rd effects. Parallel flow condenser is used for condensing vapors coming from 3rd effect. Liquor has an incoming temperature of about 120°F and outgoing of about 135°F. Density of liquor is continuously controlled in this operation.

Results: Evaporator is doing an excellent job, according to the Superintendent of Refining. Since automatic control is complete, little operating labor is required. Unit has continuously met capacity requirements without delaying production. Maintenance has been extremely low.

Evaporator has helped to maintain the quality of the product, stainless steel construction eliminating the possibility of contamination by dissolved solids. Unit is more economical with respect to steam than former evaporator due to the use of vapor heater.

(Triple effect evaporator is product of Goslin-Birmingham Mfg. Co., Inc., Dept. CP, Birmingham 1, Ala. Check CP 4927 opposite last page.)

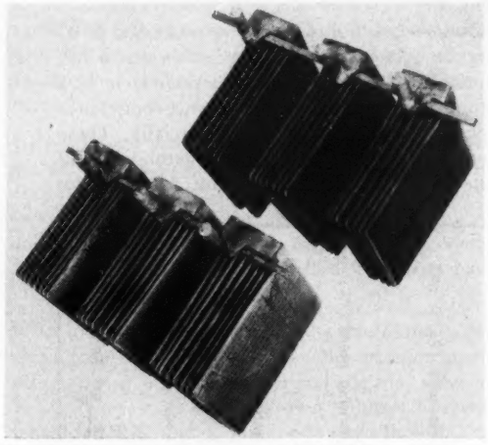
Processing and Engineering Data begins on page 204

Tough corrosion problem whipped in drying cabinet by high chrome-nickel steel . . .

resists sulfuric acid, high temperature conditions; original linings still in use after six years

Problem: Acid drippings in stainless steel-lined drying cabinets ate holes next to the welded joints and made repairing necessary about once a week at Reading Batteries, Inc., Reading, Pennsylvania. Measuring 4 x 2 x 2′ deep, the cabinets are used to dry battery plates. Temperatures in cabinets reach as high as 500°F, and remain there for about two hours.

Although plates are first washed with water to remove as much of the sulfuric-acid electrolyte as possible, a dilute film of acid still remains on the surface when plates are put into cabinet.



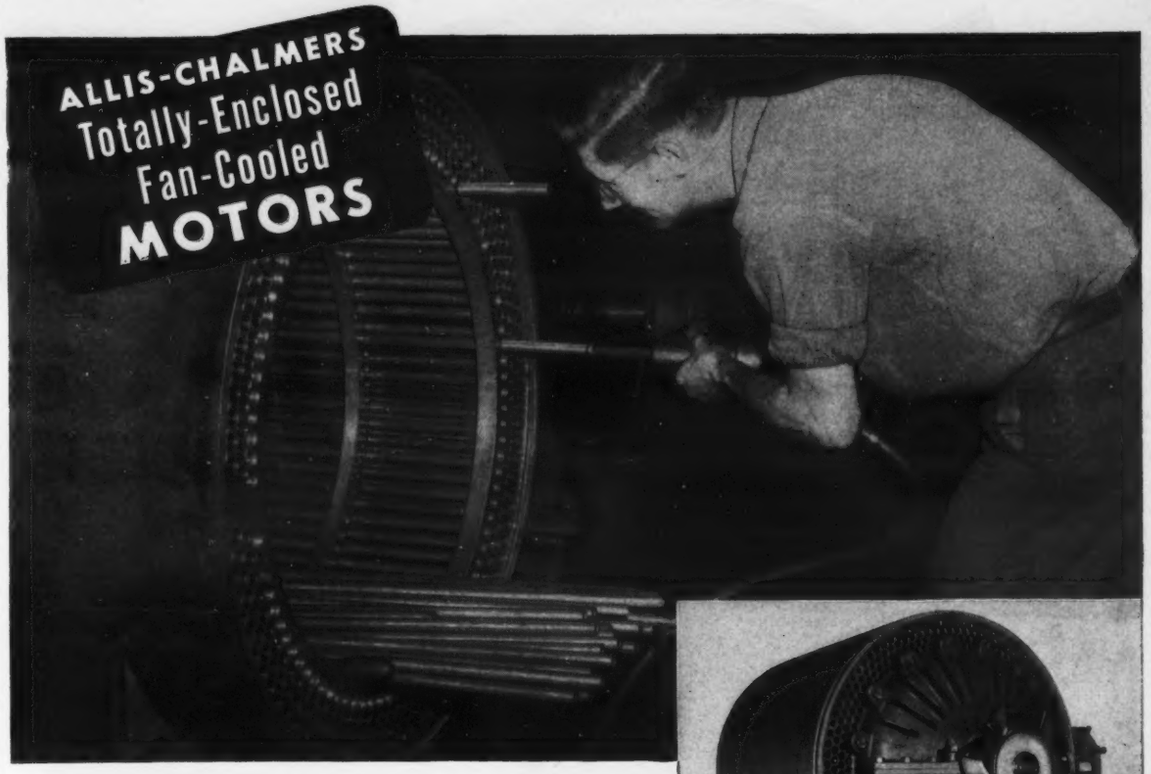
Battery plates are dried in stainless-lined cabinets at temperatures up to 500° F

Acid increases in concentration as temperature rises, and finally passes off as vapor. Various kinds of stainless steel were tried, but none seemed to be able to stand up against the severe conditions.

Solution: Company lined cabinets with a sulfuric acid-resisting, high chrome-nickel steel. Called Carpenter stainless No. 20, linings are 11 gage of about 1/8″ thickness. Linings overlap about 4½ inches at top of cabinet. Lids are also lined with the material.

Results: Corrosion has stopped completely. After six years service, original linings are still in use. Some parts are even reported to have original shiny finish.

(Stainless No. 20 is product of The Carpenter Steel Company, Dept. CP, 1937 Palmer Street, Reading, Pa. . . . or for more information reader may simply check CP 4928 on handy form opposite last page.)



3600-rpm explosion-proof motor with fan housing removed to show unidirectional fan.

These heat exchanger tubes

Protect this motor from dirt and corrosion

COOLING AIR is carried through the heat exchanger tubes with sufficient velocity to expel practically all kinds of dirt. If oily or sticky dirt should cling, tubes can be ramrodded clean on the spot in a few minutes because tubes are straight and tube ends are exposed. Also, the tubes are distributed uniformly around the perimeter of the stator yoke and along its full length — cooling all parts of the motor evenly.

Choice of Corrosion-resistant Materials

You can lick corrosion with this motor, too. Tubes are available in a variety of materials to meet practically any corrosive atmospheric condition. Allis-Chalmers tube-type motors have long and successful experience in such difficult applications as caustic plants, refineries and petrochemical plants, power plants with fly ash problems and many others.

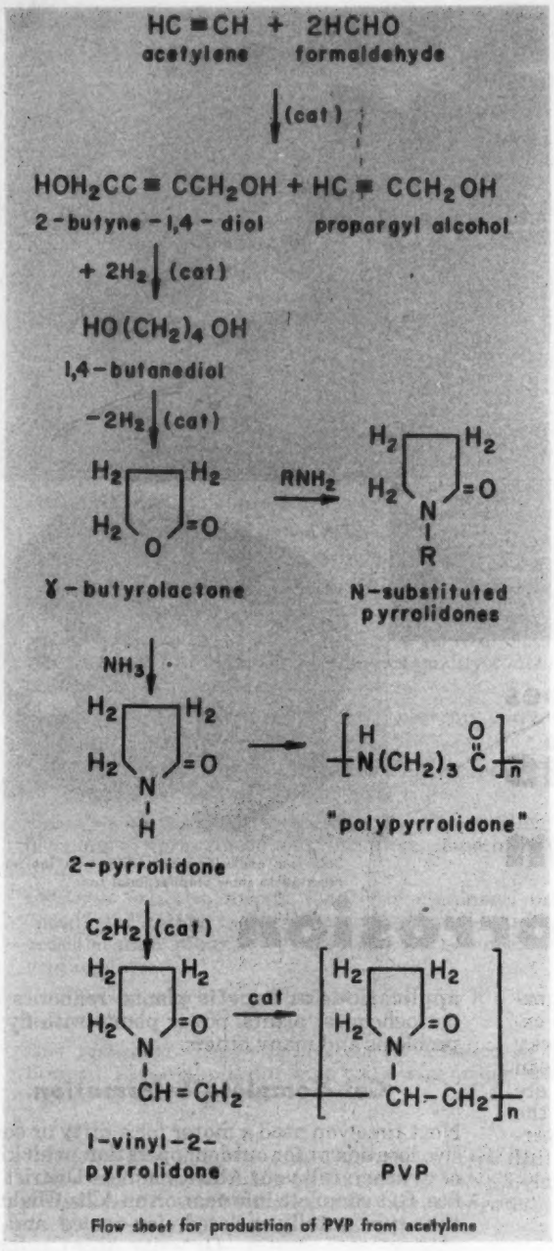
Get Complete Information

Next time you need a motor for a dirty or corrosive location or for outdoor operation in all kinds of weather, call your Allis-Chalmers District Office. Get complete information on Allis-Chalmers tube-type totally-enclosed, fan-cooled and explosion-proof motors. Or write Allis-Chalmers, Milwaukee 1, Wisconsin, for Bulletin 51B7149. Available in ratings on frames larger than NEMA 505 up to 3000 hp.

A-4559

ALLIS-CHALMERS

When inquiring check CP 4929 opposite last page



Flow sheet for production of PVP from acetylene

Produced through "Reppe Chemistry —"

chemicals from acetylene find interesting uses

Ethynylation with formaldehyde at pressures above atmospheric is first step in making series of commercially-important products

Reppe chemistry — that phase of acetylene chemistry involving reactions at pressures greater than atmospheric — has brought into being a number of products having commercial potential.

Initial products that will be available on a large scale later this year are made in a series of six steps. First of these is ethynylation reaction by which acetylene is added to formaldehyde at about 90 psi and 100°C over a copper acetylide catalyst to give a mixture of propargyl alcohol and 2-butyne-1, 4-diol.

Propargyl alcohol can undergo reactions characteristics of primary alcohols, a triple bond, and a methane hydrogen. It is soluble in water and many organic solvents, and has found use as a corrosion inhibitor in halogenated compounds. The chloride and bromide are of interest in the agricultural field and in syntheses of pharmaceuticals, such as Vitamin A.

2-Butyne-1, 4-diol is soluble in water and polar organic solvents. Reacting as both a glycol and a disubstituted acetylenic compound, it is a promising intermediate for many compounds not previously available commercially. These include: hydroxymethyl vinyl ketone, 1,2,4,-butanetriol, hexamethylolbenzene, 1,4,-dichloro-

	Purity (%)	Appearance	Sp gr (25°/4°C)	Viscosity (25°C, cp)	Melting point (°C)	Boiling point (°C)	Color	LD_{50} gm/kg
Propargyl alcohol	97 (min)	Volatile liquid	0.948 -.949 (20/4)	1.68 (@ 20°C)	−52	115	Almost Colorless	0.07
2-Butyne-1,4-diol	35% solution	In aqueous solution	1.04-1.05				Colorless to Straw Yellow	
	95-97 (type anal)	Solid			57.5*	246-248* with dec.	Almost Colorless	0.125
1,4-Butanediol	>96	Liquid	1.012-1.016	65-70	18-1.95	221-231	Almost Colorless	2
Butyrolactone	98.6-98.8	Liquid	1.124	1.7	−45.8 to −46.3	204-8	Almost Colorless	0.5-0.7
2-Pyrrolidone	>98	Liquid (f. p. at room temp.)	1.107*	13.3*	25*	245	Almost Colorless	6
N-Methyl-2-pyrrolidone	>98	Liquid	1.026-1.028	1.65*	−24	202	Almost Colorless	7
1-Vinyl-2-pyrrolidone	>99 (Stabilized with 0.1% NaOH)	Liquid	1.04	2.07	13.5	94-6 (@ 13-14 mm)	Almost Colorless	1.5
Polyvinylpyrrolidone (PVP)	White powder available in several molecular weight ranges with varying specifications for pharmaceutical, cosmetic, and industrial uses.							100+

*Pure compound

2-butyne, and pyrroles. Alone, butynediol is an effective corrosion inhibitor in pickling of iron. Compound is a skin irritant, but not a sensitizer.

1,4-Butanediol is obtained by complete hydrogenation over a Ni-Cu-Mn catalyst. This new glycol is proving its importance in improved polymeric-type plasticizers, as a component or cross-linking agent in new polyester resins, and as a starting material for polyurethanes, adiponitrile, tetrahydrofuran, and succinic acid. It has specialized use as a softener, lubricant, and humectant in gums and resins and in inks and cork products. With hexamethylene diisocyanate, compound forms a polyurethan fiber, noted for high tensile strength and resistance to water and acids.

γ-Butyrolactone is formed by ring closure with dehydrogenation over a Cu-Cr catalyst on silica gel at 200-250°C. Soluble in water and most organics other than aliphatics, it is a powerful general organic solvent for polyacrylonitrile and many other polymers. It is also used as a swelling agent for cellulose acetate and as a selective solvent for purification of natural gas acetylene. As an intermediate, it forms a number of compounds derived from 4-hydroxybutyric acid.

2-Pyrrolidone is formed on reaction of the above with ammonia. Compound will polymerize in presence of alkaline catalysts under pressure at 230°C to a linear condensation polymer resembling nylon and perlon polymers, and which can be spun, molded, or extruded into fibers and plastics having interesting properties.

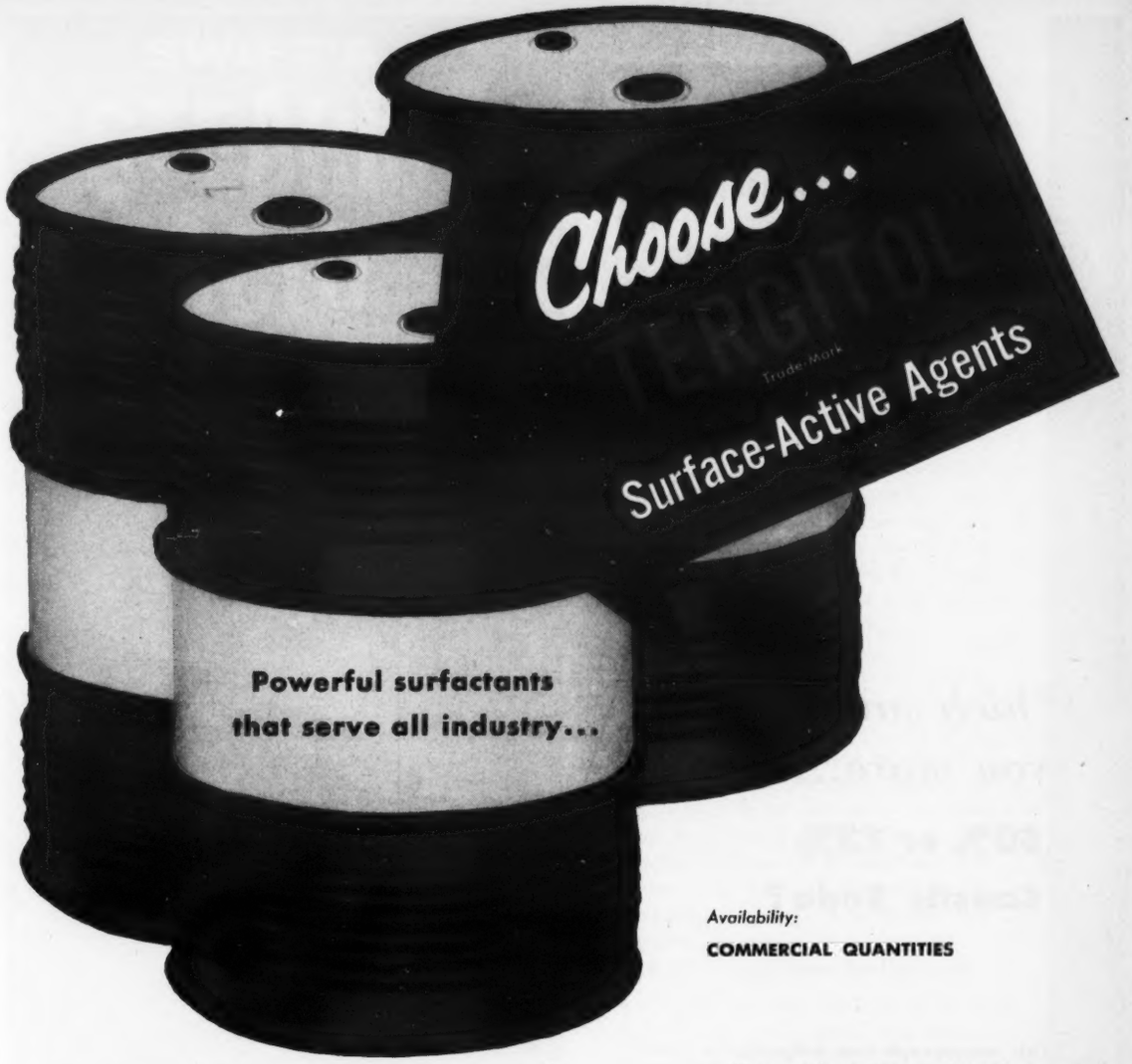
With methyl amine, ***N*-methyl-2-pyrrolidone** is derived from butyrolactone. Like the parent chemical, it too is a powerful general organic solvent. It can dissolve 39 times its own volume of acetylene (@ 20°C and 8 mm pressure). It will also dissolve cellulose triacetate and polystyrene.

1-Vinyl-2-pyrrolidone is formed when 2-pyrrolidone reacts with acetylene under pressure of their alkali metal salts at 130-160°C. Polymerization with almost all vinyl monomers can be conducted in bulk or in suitable solvents to yield a wide variety of materials.

Polyvinylpyrrolidone (PVP) is yielded by homopolymerization of the above in presence of light or peroxide catalysts. A white powder available in a number of molecular weight ranges, it dissolves in water and many organic solvents. It can be made soluble in hydrocarbons and fluorinated hydrocarbons by special techniques. PVP acts as a protective colloid, stabilizing emulsions, dispersions, and suspensions. Having extremely high physiological compatibility, it is neither a primary irritant or sensitizer. It has detoxifying action on many compounds.

Pharmaceutical uses include those as a blood volume, expander, in maintaining procaine-penicil-

(*Continued on next page*)



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COMMERCIAL QUANTITIES

NON-IONICS—all purpose surfactants

Tergitol Non-Ionic NPX—detergent, wetting agent, dispersant, and emulsifier

Tergitol Non-Ionic TMN—wetting agent, leveling agent, spreader

Tergitol Non-Ionic XC —low foaming detergent, emulsifier, and dispersant

Tergitol Non-Ionics NP-14, NP-27, NP-35—emulsifiers and wetting agents

ANIONICS—wetting and penetrating surfactants

Tergitol Anionic 7, **Tergitol Anionic P-28**—for dilute solutions of acids, alkalies, and salts

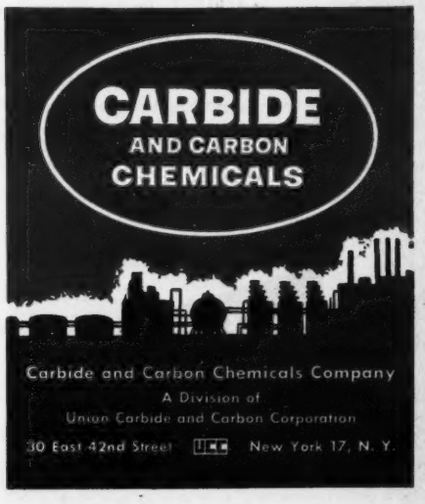
Tergitol Anionic 4—for moderately concentrated solutions of acids, alkalies, and salts

Tergitol Anionic 08, **Tergitol Anionic EH**—for concentrated solutions of acids, alkalies, and salts

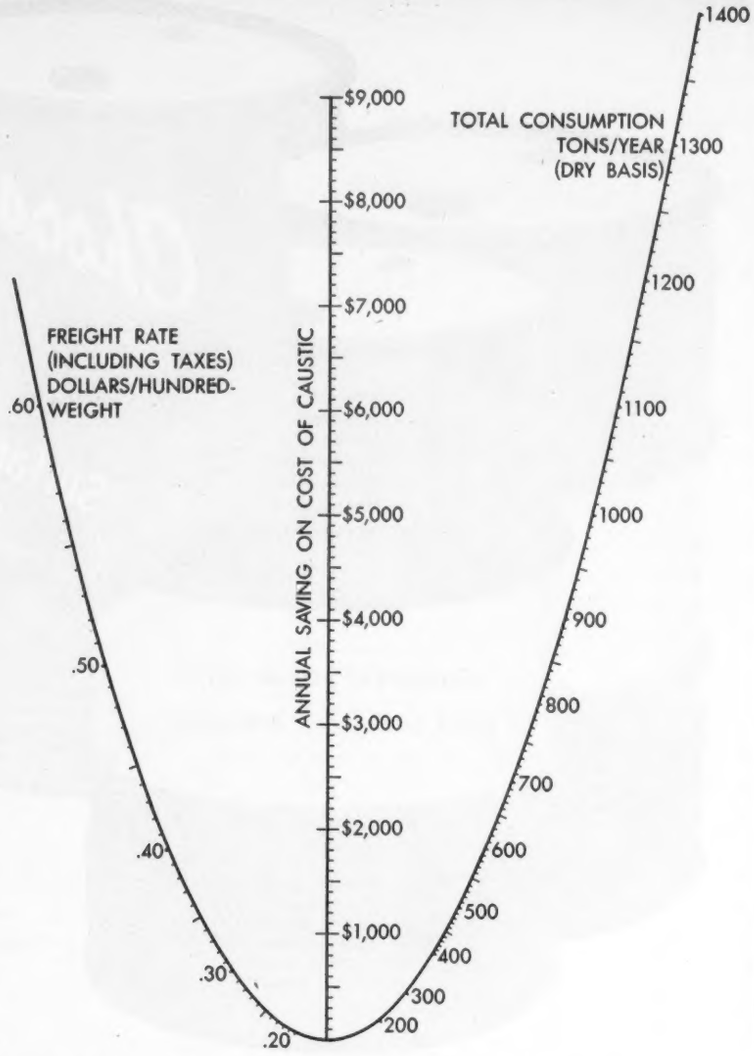
For samples and detailed technical literature call or write the nearest of our 23 offices.

In Canada: Carbide Chemicals Sales Company, Division of Union Carbide Canada Limited, Toronto.

The term "Tergitol" is a registered trade-mark of Union Carbide and Carbon Corporation.



When inquiring check CP 4930 opposite last page



Which saves you more...

50% or 73% Caustic Soda?

This nomograph can help you decide Are you using the caustic solution that's least expensive for you? A few seconds' calculation with this nomograph will help you decide.

How to find if you can save on 73% caustic soda Simply draw a line from your freight rate (including taxes) to your annual consumption in tons on a dry basis. Your approximate savings will appear where this line intersects the center line of the nomograph.

This figure represents your savings on freight charges after the $2.00 premium price on 73% caustic soda has been deducted.

From this figure you must deduct a depreciation charge based on the cost of dilution equipment. Your Hooker technical service man is ready to advise you on the equipment needed and its cost.

Double-check your findings this way Before you make a final decision on 50% or 73%, give yourself the advantage of expert technical advice. Let your Hooker technical service man show you what equipment you will need for 73%. He will figure your exact savings—based on a realistic study of your operations.

For quick service, write or phone the nearest Hooker office.

"CAUSTIC SODA BUYER'S GUIDE" is the title of a new pocket-size booklet we'll be glad to send you free. Contains helpful facts on the economics of 50% and 73% solutions; other forms of caustic soda; capacities of tank cars and other containers; useful shipping information. Write us for a copy.

HOOKER CHEMICALS

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1905—Half a Century of Chemicals
From the Salt of the Earth—1955

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When inquiring check CP 4931 opposite last page

(Continued from preceding page)

lin suspension, and as a retarder for many drugs. It is of interest as a film-forming polymer, suspending agent, and thickening agent in soap, cosmetic, and food processing industries. In the cosmetic industry it finds application in aerosol hair lacquers where it gives a soft flexible film, substantive to the hair, and readily removed on washing. Other uses under study are in shampoos, shaving lathers, hand creams and lotions, and perfumes, where its properties of solubilization, desensitization, detoxification, and substantivity, find application. In dentrifices, PVP removes yellow stains on teeth. It is also used in soaps and synthetic detergents, preventing redeposition of soil during washing.

In textile applications as an effective component in dye stripping and a size for various synthetic fibers and glass fibers it possesses unique properties. Under test are uses in agricultural chemicals, adhesives, lithographic films, and foods.

(Acetylene derivatives are a product of General Aniline & Film Corp., Dept. CP, 435 Hudson St., New York 14, N.Y. Check CP 4932 opposite last page.).

When compounded with special wax, films have low temp plasticity, hardness, gloss, inertness . . .

product eliminates need for additives to combination of waxes used in paper industry

Uses: Recommended for use in manufacture of waxed paper, carton and containers, varnishes and lacquers, rubber compositions, printing inks, electrical insulating compounds, and paste polishes.

Features: Product eliminates need for all additives to the combination of waxes used in the paper industry. Thus a user will be able to have a true combination of waxes rather than a blend of waxes with chemicals.

Wax imparts to film plasticity at low temp, hardness, gloss, heat seal, inertness to many chemicals and solvents, and extended shelf life and sales appeal. Paraffin and micro wax combinations are upgraded by product since it gives great toughness and strength.

Description: Polymekon, a specially processed petroleum wax, is yellow in color and has a softening point of 200°F. It is miscible with all paraffin and microcrystalline waxes.

(Petroleum wax is a product of Warwick Wax Co., Subsidiary of Sun Chemical Co., Dept. CP, 10th St. and 44th Ave., Long Island City 1, N.Y. . . . or for more information check CP 4933 on handy form opposite last page.)

Industrial and agricultural chemicals cataloged

Comprehensive eight-page catalog includes complete information on the boron, sodium, potassium, lithium, and bromine chemicals available from manufacturer. Products find major use in the glass, ceramic, porcelain, steel, oil, paint, and plastics industries. Also covered are agricultural chemicals, refrigerants, and aerosols.

Product catalog "Chemicals" is issued by American Potash & Chemical Corp., Dept. CP, 3030 W. Sixth St., Los Angeles 54, Calif. . . . or for more information check CP 4934 on handy form opposite last page.

Eyes tired . . .
but still in the dark?

It's not easy on the eyes to keep up with your reading on the flood of basic chemical materials being introduced these days. Maybe your eyes look like those above after a long session poring over industrial magazines, technical data sheets, or bulletins.

And perhaps, even after such an "eye-tearing" session, you still haven't found the chemical material you need for improving your old process or commercializing your new one . . . *you're still in the dark.*

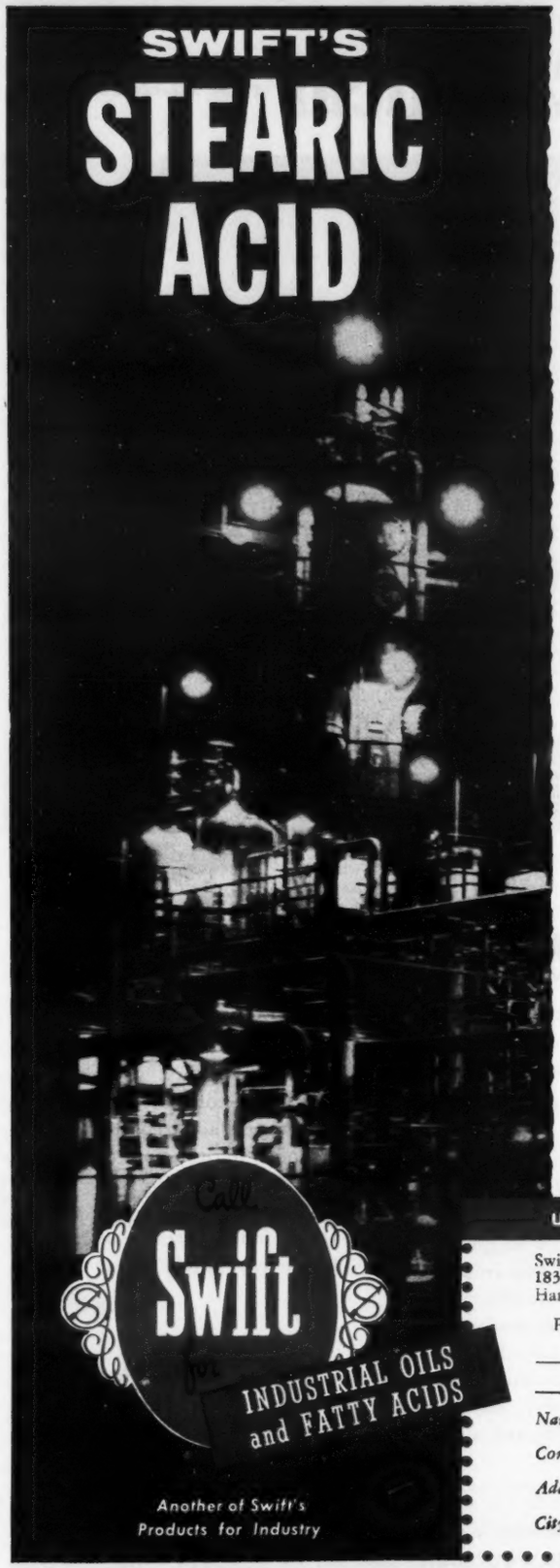
If this describes your case, we suggest you see April CHEMICAL PROCESSING, in which we are featuring our Materials section.

In addition to our customary articles on the new chemicals, we're planning a listing of chemicals introduced during 1954, including concise details of composition and properties.

There'll be a "use-index", too, as another aid in pin-pointing what you need.

This feature is being custom-tailored with you, the reader, in mind. Our aim is to help you find your chemical materials quickly . . . with a minimum of eye-strain.

SWIFT'S
STEARIC ACID



Call Swift for INDUSTRIAL OILS and FATTY ACIDS

Another of Swift's Products for Industry

Unique low temperature solvent process helps assure...

BETTER COLOR AND COLOR STABILITY

High temperatures are a real enemy to the kind of color and color stability required by modern stearic acid needs.

Swift's Stearic Acid is extracted below room temperature in a unique low temperature solvent process. Special processing steps not only protect the color and heat stability of the Swift product, but permit *selective* extraction of fatty acids, color bodies and other factors. The result is a wide variety of stearic acids to meet *specific* needs—products which are literally *man-made from nature's chain,* that can be relied upon in use, dependably specified for your most exacting requirements.

If *you* have an application where good heat and color stability are a requisite, write for a trial order on Swift's Single, Double, Triple pressed or Cosmetic Grade Stearic Acid. See how low temperature processing can make a difference and remember . . .

ONE TRIAL IS BETTER THAN A THOUSAND CLAIMS

Oleic Acid (Red Oils) • Animal Fatty Acids • Vegetable Fatty Acids • Stearic Acids • Hydrogenated Fatty Acids • Larex (Swift's Lard Oils) • Neatex (Swift's Neat's-foot Oils) • Sperm Oils • Spermaceti U.S.P. • Monoglycerides • Sulfonated Oils • Textile Processing Oils • Anti-Foam Agents • Glycerine • Tallows • Palmex (for Steel Mills) • Hydrogenated Glycerides •

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_____ ☐ Send Industrial Oil Bulletin.

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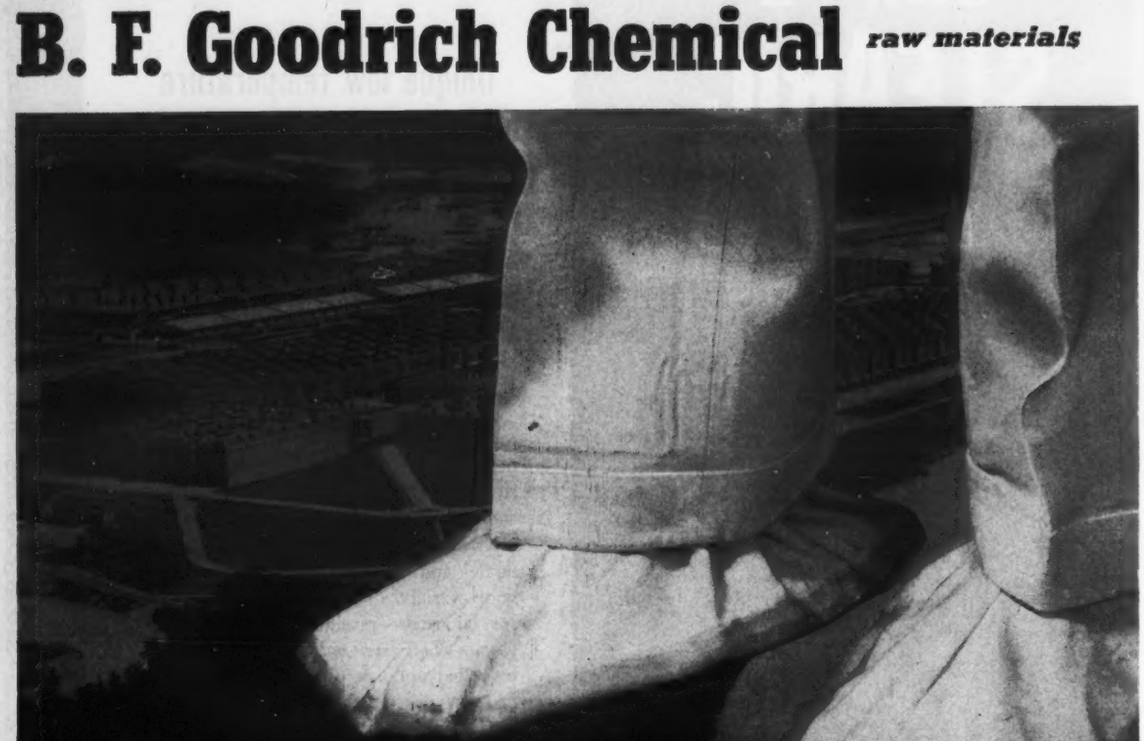
City _____ *Zone* ____ *State* _____

When inquiring check CP 4935 opposite last page.

Another new development using

B. F. Goodrich Chemical *raw materials*



Shoe Fashions at Oak Ridge

YOU MIGHT laugh at yourself the first time you wore these shoe covers, but their purpose at an Oak Ridge Atomic Energy Plant is no laughing matter.

These canvas shoe covers help prevent the spread of radioactive contamination. Workers slip them on over their shoes when entering a contaminated area. They are made of canvas, with the walking surface coated with a plastisol based on Geon paste resin.

They are thoroughly flexible, and the Geon coating gives them a tough, abrasion-proof surface. The cost of these shoe covers is low despite their important use—thanks to Geon! Maybe this unique use for Geon may help you improve or develop more saleable products, for Geon-based plastisols and other Geon materials have helped build sales for many products—such as colorful upholstery, wire insulation, rigid paneling and tubing and many more.

Check with us; we'll help you select the Geon material best suited to your product's requirements. For technical information, please write Dept. BD-1, B. F. Goodrich Chemical Company, Rose Bldg., Cleveland 15, Ohio. Cable address: Goodchemco. In Canada: Kitchener, Ontario.

GEON RESINS • GOOD-RITE PLASTICIZERS . . . the ideal team to make products easier, better and more saleable.
GEON polyvinyl materials • HYCAR American rubber and latex • GOOD-RITE chemicals and plasticizers • HARMON colors

When inquiring check CP 4936 opposite last page

Powerful organic chelating agents for cation control described

Versenes, powerful organic chelating agents for controlling metallic ion contamination in chemical processing waters, are subject of detailed technical bulletin. The digest-size booklet of over 100 pages is divided into four sections: general information, applications, analytical methods, and toxicity data.

"The Versenes" (Tech Bul No. 2) is issued by Versenes, Inc., Dept. CP, 875 Waverly St., Framingham, Mass. When inquiring specify CP 4937 on handy form opposite last page.

Water solubility, vapor pressure, and toxicities are lower for higher n-alkyl anilines

Uses: Compounds should be applicable in processes requiring n-alkyl anilines in production of dyes and pigments, surface-active agents, flotation reagents, explosives and propellant stabilizers, gum and corrosion inhibitors, gasoline additives, rubber chemicals, plastics, textile chemicals, pesticides, and surface coatings.

Features: Water solubility, vapor pressures, and toxicities are lower than aniline and the lower n-alkyl anilines. Boiling points and solubilities in oil and hydrocarbons are higher.

Reaction with ethylene oxide yields corresponding substituted phenyl ethanolamine. Reduction yields corresponding alkyl cyclohexamine. Presence of the alkyl group contributes oil solubility to these compounds and derivatives made from them.

Description: n-Butyl aniline and n-2-ethylhexyl aniline are mild-odor liquids, and are substantially free of the corresponding dialkyl aniline. Typical physical properties of the two compounds:

	n-Butyl Aniline	n-2-Ethylhexyl Aniline
Boiling point (°C @ 10 mm Hg)	112	152
Freezing point (°C)	−15.1	<−70
Sp gr (20/20°C)	0.9288	0.9119
Surface tension (dynes/cm @ 20°C)	31.2	29.8
Solubility in water (% by wt @ 20°C)	<0.01	<0.01
Absolute viscosity (cps @ 20°C)	3.3	7.4
Flash point (COC, °F)	225	325

Both compounds are miscible at 25°C with benzene, heptane, CCl_4, ethyl ether, acetone, and methanol.

Toxicity is of a lower order than aniline. Neither material presents an acute hazard with respect to skin penetration, but both compounds would be expected to produce skin irritation. Small animal tests show that both compounds should be handled

in such manner as to avoid prolonged or repeated breathing of the vapors. Contact of the liquids with the skin should be avoided.

(n-Butyl aniline and n-2-ethylhexyl aniline are products of Carbide and Carbon Chemicals Co., a div. of Union Carbide and Carbon Corp., Dept. CP, 30 E. 42nd St., New York 17, N. Y. . . . or for more information check CP 4938 on handy form opposite last page.)

High tensile and tear strengths for silicone rubber compounds made possible with gums . . .

compounded with reinforcing filler, tensiles in range of 1600 psi are possible

Uses: To produce silicone rubber compounds of high strength.

Features: Strength of finished compounds is double that of any known previously available silicone rubber. In combination with a reinforcing filler, compounds having tensiles in range of 1600 psi and 200-300 ppi tear strengths are produced. Elongations are also 50% higher.

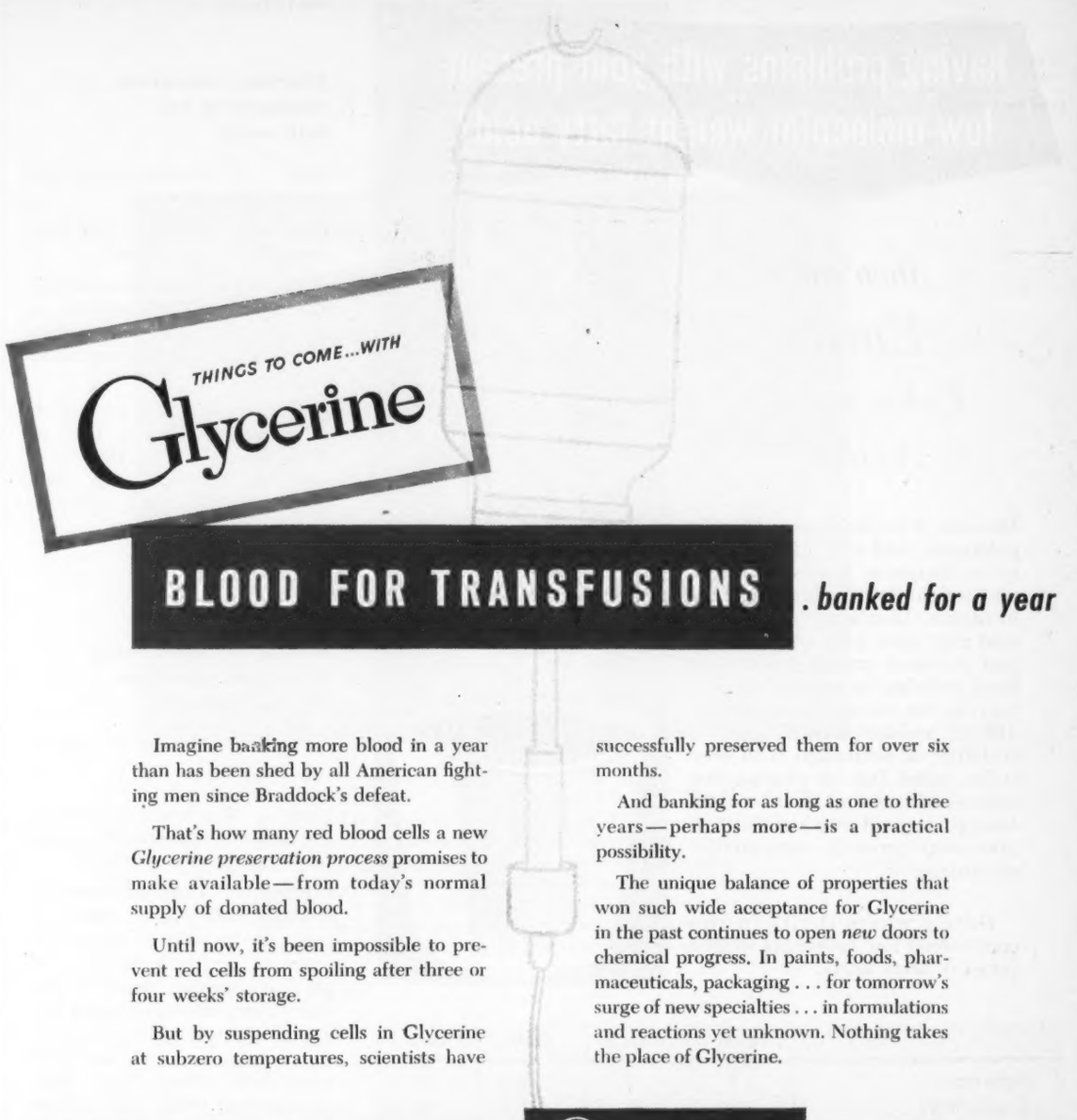
Description: Designated #81465 and #81477, the silicone rubber gums are available on an experimental basis. They are designed to be compounded with du Pont's Fine Silica Technical, which has recently become commercially available. Gum #81465 has normal shrinkage and flexibility at −65°F. Gum #81477 has lower shrinkage and retains flexibility below −100°F.

(Silicone rubber gums are a product of Silicone Products Dept., General Electric Co., Dept. CP, Waterford, N. Y. . . . or for more information check CP 4939 opposite last page.)

Production of high Btu oil gases from crude shale oils realized

Interim report of 28-pages presents results of a study of high Btu oil gas production from crude shale oils. As part of Project 88, sponsored by the Gas Production Research Committee of the American Gas Association, the objectives of the study were 1) to extend to shale oils the relationships between oil properties, cracking conditions, and product yields and comparisons developed for petroleum oils in Institute of Gas Technology Bul No. 12, and 2) to determine substitutability of shale oil gases for high methane natural gas.

To obtain "Production of High-Btu-Oil Gases from Crude Shale Oils" remit $2.50 direct to Institute of Gas Technology, 17 W. 34th St., Chicago 16, Ill.


THINGS TO COME...WITH
Glycerine
BLOOD FOR TRANSFUSIONS . banked for a year
Imagine banking more blood in a year than has been shed by all American fighting men since Braddock's defeat.
That's how many red blood cells a new *Glycerine preservation process* promises to make available—from today's normal supply of donated blood.
Until now, it's been impossible to prevent red cells from spoiling after three or four weeks' storage.
But by suspending cells in Glycerine at subzero temperatures, scientists have successfully preserved them for over six months.
And banking for as long as one to three years—perhaps more—is a practical possibility.
The unique balance of properties that won such wide acceptance for Glycerine in the past continues to open *new* doors to chemical progress. In paints, foods, pharmaceuticals, packaging . . . for tomorrow's surge of new specialties . . . in formulations and reactions yet unknown. Nothing takes the place of Glycerine.
This balanced group of properties keeps Glycerine's usefulness growing
HYGROSCOPICITY • STABILITY • SOLVENT POWER • VISCOSITY • NONVOLATILITY • NONTOXICITY • TASTE • MW/HYDROXYL RATIO •
HUMECTANT • CARRIER • SOLVENT • LUBRICANT • SOFTENER • EMOLLIENT • ANTI-FREEZE • ALKYD BASE •
CHECK AND SEND FOR TECHNICAL DATA
20-page booklet on Glycerine for product conditioning
12-page booklet on Glycerine standards and specifications
16-page booklet on Glycerine properties and applications
For your free copy of any or all of these booklets write: GLYCERINE PRODUCERS' ASSOCIATION • 295 Madison Ave., New York 17, N. Y.
When inquiring check CP 4940 opposite last page

having problems with your present low-molecular weight fatty acid?

then try

Emfac®

Pelargonic

Acid!

Because of its odd-carbon length, pelargonic acid acts differently in many instances from low-molecular weight fatty acids occurring in nature. That's why pelargonic acid may give your end product just the exact property you have been striving to attain. Or...it may be the answer to a possible difficult problem of melting point, stability, or solubility. Whatever it be, send for an evaluation sample of unusual, Emfac 1202 Pelargonic Acid and see if it can give your product competitive advantages.

Here's where it fits in the commercial low molecular-weight series of fatty acids.

	Caprylic	Pelargonic	Capric	Lauric
Carbon Atoms	8	9	10	12
Molecular Weight	144	158	172	200
Titer, °C	12	10	30	42
Melting Point, °C	16	8	31	43
Boiling Point, °C at 760 mm.	239	255	270	299
Iodine Value	1	nil.	1	1
Acid Value	390	350	325	280

Mail coupon today for descriptive literature.

Emery

Fatty Acids & Derivatives
Plastolein Plasticizers
Twitchell Oils, Emulsifiers

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Emery Industries, Inc.
Dept. CP-2, Carew Tower
Cincinnati 2, Ohio
Please send descriptive literature on Emfac 1202 Pelargonic Acid.

Name.....Title.....

Company.....

Address.....

City.....Zone....State.....

When inquiring check CP 4941 opposite last page

MATERIALS

Disodium adenosine triphosphate has high purity

Uses: In investigations of biochemical reactions.

Features: Material is free from non-adenine nucleotides.

Description: Crystalline disodium adenosine triphosphate is virtually pure according to chromatographic and electrophoretic evaluation.

(Disodium ATP is a product of Pabst Laboratories, a Div. of Pabst Brewing Co., Dept. CP, 1037 W. McKinley Ave., Milwaukee 3, Wis. Check CP 4942 opposite last page.)

Nitrate-ammonia ratios differ between three nitrogen solutions . . .

give wide range of physical properties

Uses: As a source of ammonium nitrate in ammonia and water, for fertilizer manufacturers.

Features: Three solutions are available, offering a choice in ratio of ammonium nitrate to ammonia, and a wide range of physical properties. Solutions provide efficient media for quick curing of superphosphate, minimizing segregation, and supplying more total nitrogen than other ammoniating media. Mixed fertilizers using these solutions show no loss of nitrogen during storage.

Description: CSC Nitrogen Solutions have following compositions:

	101	102	103
NH_4NO_3 (% by wt.)	65.0	55.0	66.8
Free NH_3	21.7	26.0	16.6
H_2O	13.3	18.5	16.6
Total nitrogen (% ± 0.5%)	40.6	40.8	37.0

Solution 102 is especially useful during cold weather. CSC 103 is better in hot weather because of its low vapor pressure. This also facilitates handling and permits

LITHIUM

. . . The Miracle Element

Lithium has made the world its market. To supply that market, Lithium Corporation has assured itself a supply of spodumene ore, the most plentiful and economic lithium raw material, sufficient for years to come. To meet industry's demands for more Lithium products, we are doubling our metal-making capacity and greatly increasing overall production. A new research and development laboratory will continue to develop new and improved uses for Lithium chemicals for the benefit of all industry.

Lithium has found a permanent place in the organic chemical, ceramic, metallurgical, pharmaceutical, grease and atomic energy fields. Lithium is a valuable additive in glassware and pottery, vitamins, welding flux, optical lenses and prisms, cosmetic cream, storage batteries, varnish, candles, bleaches, signal flares and television tubes. Many of its uses were unheard of a year or two ago.

Investigate Lithium's unusual, sometimes paradoxical, often uniquely valuable properties. Research quantities and Data Sheets are available on some 25 different products — metals, salts and special compounds. Write for them.

. . .trends ahead in industrial applications for Lithium

LCA LITHIUM CORPORATION OF AMERICA, INC.

General Offices: Suite A, Rand Tower, Minneapolis 2, Minn.

Mines:

Black Hills, South Dakota, Bessemer City, North Carolina, Manitoba and Quebec.

Plants:

St. Louis Park, Minn. and Bessemer City, North Carolina

When inquiring check CP 4943 opposite last page

maximum amount of nitrogen to be incorporated during the ammoniation step. Physical properties of the solutions include:

Vapor pressure (@ 120°F, psig)	16.9	22.0	1.4
Crystallization point (°F)	23	-13	48

Adequate protective clothing, including safety goggles, should be worn when handling solutions. Vapors irritate eyes and respiratory passages, and at higher concentrations can cause injuries.

(Nitrogen solutions are products of Industrial Chemical Div., Commercial Solvents Corp., Dept. CP, 260 Madison Ave., New York 16, N.Y. . . . or for more information check CP 4944 on convenient Reader Service slip opposite last page.)

Imparts water-resistant, lubricating, softening, and solvent qualities

Uses: For utilization as a primary plasticizer and solvent for natural and synthetic rubbers and as a secondary plasticizer for cellulose esters and polyvinyl resins. It is also recommended as a textile lubricant.

Features: Solvent, softening, water-resistant, and lubricating qualities are imparted by the compound.

Description: Butyl oleate (tech.) is an amber-colored oily liquid, having these specifications:

Saponification No.	164-172
Acidity (% as oleic, max)	0.5
Sp gr (@ 25°C)	0.862-8
Iodine No. (max)	80.0
Moisture (% max)	0.25

(Butyl oleate is a product of Harwick Standard Chemical Co., Dept. CP, 60 S. Seiberling St., Akron 5, Ohio . . . for more information check CP 4945 opposite last page.)

For more information on product at right, specify CP 4946 . . . see information request blank opposite last page.

MONTAUK POINT LIGHTHOUSE, completed in 1797, was one of the first to be constructed by the Federal Government following organization of the Lighthouse Service in 1789. Standing on a high headland of rocks and sand dunes, it marks the southern entrance to Block Island Sound as well as the eastern extremity of Long Island—an area of great danger to ships because of violent storms and the prevalence of fog.

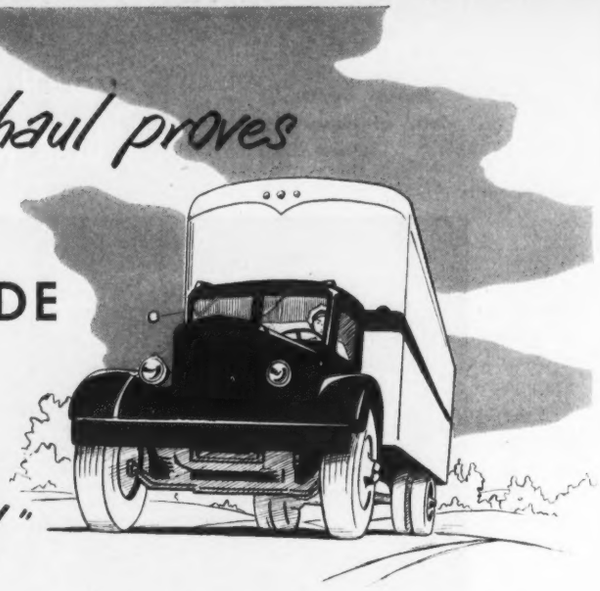
Safe passage through many channels of production has been provided to thousands of users of electrochemicals by the skillful cooperation of Niagara Alkali Company. Niagara is a pioneer in the development, production and application of these important chemicals:
Nialk® Liquid Chlorine, Nialk Caustic Potash, Nialk Carbonate of Potash, Nialk Paradichlorobenzene, Nialk Caustic Soda, Nialk TRICHLORethylene, Niagathal® (Tetrachloro Phthalic Anhydride).

NIAGARA ALKALI COMPANY
60 East 42nd Street, New York 17, N. Y.

1,000-mile road haul proves

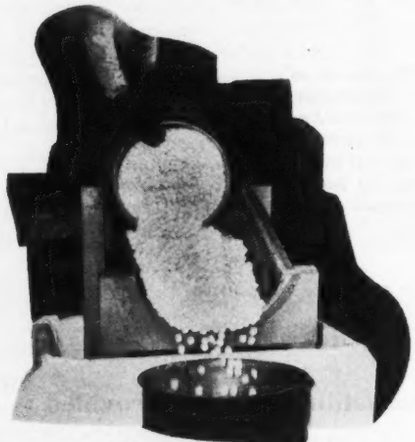
NATIONAL MALEIC ANHYDRIDE TABLETS

contain 75-90% less fines "as delivered"



By truck from producing points to Buffalo, to Chicago and back to Buffalo again went drums of three manufacturers' Maleic Anhydride. Then the contents of each drum were carefully screened and the 2 mesh "fines" weighed. Here's what the scales showed:

NATIONAL "TABLETS"—1.12 lb. BRAND A—7.78 lb. BRAND B—10.40 lb.



NATIONAL "TABLETS" 1.12 lb. "FINES" — BRAND A 7.78 lb. "FINES" — BRAND B 10.40 lb. "FINES"

We knew our new Moundsville plant was making exceptionally good-to-look at, easy-to-handle Maleic Anhydride. We knew our new tablet form resists degradation in shipping and handling. But, frankly until now we didn't fully realize how downright all-around good National Maleic Anhydride Tablets really are. There's no price premium on this premium quality product. So why not have the advantages of uniform, quick-dissolving, safer-to-handle National Maleic Anhydride Tablets by sending your next order to our nearest office?

NATIONAL ANILINE DIVISION
ALLIED CHEMICAL & DYE CORPORATION
40 RECTOR STREET, NEW YORK 6, N. Y.

Boston Providence Philadelphia Chicago San Francisco
Portland, Ore. Greensboro Charlotte Richmond Atlanta
Los Angeles Columbus, Ga. New Orleans Chattanooga Toronto

When inquiring check CP 4947 opposite last page

Lowers interfacial tension between emulsifiable oil and water

Uses: As universal agricultural emulsifier for liquid pesticide formulations.

Features: Emulsifier operates by lowering interfacial tension between emulsifiable oil and water to fraction of dyne per cc. Low tension favors spontaneous emulsification causing toxicant liquid to disperse immediately into cloud of extremely fine globules when poured into water. Necessity for vigorous agitation is reduced.

Description: Product is special blend of anionic and nonionic surface active agents. Toximul 500 is usable with at least 12 different toxicants, using only three or four percent of emulsifier over range of water hardness from 50 to 1000 ppm.

(Toximul 500 is a product of Ninol Laboratories, Inc., Dept. CP, 1719 S. Clinton St., Chicago 16, Ill. Check CP 4948 opposite last page.)

When cured, forms a solid plastic having wide temperature range, good electrical properties . . .

useful temperature range is from −55° to 125°C

Uses: As an impregnant for capacitors and RF coils and filters.

Features: When cured, material forms a solid plastic with a useful temperature range from −55°C to 125°C. Electrical properties are outstanding.

Description: Stycast 62 is supplied as a low viscosity liquid. Properties of the cured material are:

Dielectric content (60 to 10^5 cy)	2.6
Dissipation factor (60 to 10^5 cy)	<0.0003
Dielectric strength (vpm)	>500

(Plastic impregnant is a product of Emerson & Cuming, Inc., Dept. CP, 869 Washington St., Canton, Mass. Check CP 4949 opposite last page.)

Sodium meta periodate for glycerol test

Grade of sodium meta periodate having 99.5% purity is satisfactory for AOCS method Ea-6-51 for determining glycerol. Product can be used in place of the more expensive reagent grade.

(Sodium meta periodate of 99.5% purity is a product of Arapahoe Chemicals, Inc., Dept. CP, 2800 Pearl St., Boulder, Colo. . . . or for more information check CP 4950 opposite last page.)

Tells use of wet ground mica in vinyl acetate latex paint

Use of wet ground mica in vinyl acetate co-polymer latex paint is described in two-page bulletin.

Bul 18 is issued by the Wet Ground Mica Association, Inc., Dept. CP, 420 Lexington Ave., New York 17, N.Y. When inquiring reader may simply specify CP 4951 on convenient Reader Service slip which is located opposite last page.

Upgrades white, colored leathers increasing grain thickness, imparting tighter break . . .

effect of resin is produced by polymerization after application to leather

Uses: Resin is designed specifically for use in the manufacture of leather.

Features: Effect is produced by polymerization after application to leather. Main characteristics imparted by the resin to chrome-whites are tighter break, improvement in bellies and flacks, and the ability to hold or better shaver's weight from the pasting plates. Increased thickness of grain is evident also.

Quality and weight of colored stocks as well as whites can be upgraded by use of resin. Improvements parallel those obtained with chrome whites, and are particularly noticeable on large, spready sides.

Description: Tanak MRX is a water-soluble melamine resin. Acid, chrome, and direct dyes are compatible with resin solutions. Supplied as an amorphous white powder, it melts from 96 to 120°C. To make solutions for use in tanning, two pounds of resin are added to each gallon of water at 120-160°F, and then cooled. Resin may also be added dry to the tanning drum.

Minimum amounts must be used to get observable effects and maximum amounts must be controlled to avoid overplumping with consequent ill effects.

(Tanning resin is a product of Leather Chemicals Dept., American Cyanamid Co., Dept. CP, 30 Rockefeller Plaza, New York 20, N.Y. . . . or for more information reader may simply check CP 4952 on the convenient Reader Service slip which is located opposite last page.)

Find Viscosity of Common Gases quickly with nomograph on page 204

MATHIESON

FORMALDEHYDE

SWIFT IRON

Low in formic acid and iron, Mathieson formaldehyde meets the most rigid specifications for purity and uniformity. It is available in the following grades:

37% inhibited
37% low methanol
45% low methanol

Mathieson formaldehyde is shipped in 8 and 10,000-gallon tank cars from Morgantown, West Virginia. For further information call or write today.

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ETHYLENE OXIDE • ETHYLENE GLYCOL • DIETHYLENE GLYCOL • TRIETHYLENE GLYCOL • POLYGLYCOLS • DICHLOROETHYLETHER
ETHYLENE DICHLORIDE • METHANOL • SODIUM METHYLATE • ETHYLENE DIAMINE • CAUSTIC SODA • SODA ASH • CHLORINE • SULPHURIC ACID
SULPHUR • AMMONIA • NITRATE OF SODA • BICARBONATE OF SODA • CARBON DIOXIDE • SODIUM CHLORITE • CALCIUM HYPOCHLORITE

2903

When inquiring check CP 4953 opposite last page

get acquainted with

the newest addition to

the WILLIAMS LINE of

COPPERAS TYPE

PURE RED IRON OXIDES

OUR NEW 100 SERIES

Available in 6 Shades ranging from a Light Salmon Red to a Medium Maroon R-2200, R-2900, R-3200, R-3800, R-4800, R-5800

Compared with our other standard Copperas Reds, the "100" Series is

Brighter in color
Finer in particle size
Lower in oil absorption
Higher in purity
- - at no increase in price!

Broad range of applications includes paints, rubber, building materials, leather finishes, plastics, paper, etc. Let our samples prove the value of these pigments . . . See your Williams representative or write us direct.

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E. ST. LOUIS, ILL. • EASTON, PA.
EMERYVILLE, CAL.

When inquiring check CP 4954 opposite last page

MATERIALS

Use of pine lignin for recovery of proteins and enzymes

Eight-page bulletin shows how Indulin, a pine wood lignin, is used as a precipitant for proteins, enzymes, and related nitrogenous materials in process waters encountered in the manufacture of various products such as sugar, alcohol, grain syrup, potato starch, antibiotics, and other natural products. In some cases precipitation reduces amount of organic material in process waste waters, reducing stream pollution. A general discussion is followed by eight case histories.

Bul 105A is issued by Polychemicals Div., West Virginia Pulp & Paper Co., Dept. CP, Charleston A, S.C. When inquiring specify CP 4955 on handy form opposite last page.

Offers pleasing effects in perfumes and floral soaps . . .

effective at low concentrations, product does not cause discoloration

Uses: In perfume formulations of the lilac, muguet, jasmine, and other floral types, and in floral soap compositions.

Features: Chemical produces pleasing effects in perfumes, and tends to accentuate desirable floral topnotes in the soap. Product is effective at low concentrations and does not cause discoloration.

Description: Acetate P.A. possesses a fruity-pineapple, warm musk-like character. It has considerable coverage and odor stability.

(Perfume body is a product of Givaudan-Delawanna, Inc., Dept. CP, 330 W. 42nd St., New York 36, N.Y. . . . or for more information check CP 4956 on handy form opposite last page.)

Have advantages as intermediates, and solvents for resins, dyes, cellulose coating materials . . .

chemicals have unusual combination of properties

Uses: Nitroparaffins can be used in diversified applications such as chemical intermediates, and as specialized solvents for many coating materials (cellulose acetate, triacetate, acetobutyrate, and nitrate), vinyl resins, gums, dyes, waxes and numerous organic chemicals. They can also be used for selective extraction of aromatics from aromatic-paraffin mixtures.

Features: In chemical syntheses, the four compounds have high potential usefulness. Majority

Xtracts

USEFUL INFORMATION ABOUT REACTIVE CHEMICALS FROM THE DU PONT ELECTROCHEMICALS DEPARTMENT.

Sodium cyanide provides active nitrile group

Many a new development stems from the skillful use of an old and well-established technique. To introduce a nitrile group, for example, practical chemists have found economical Sodium Cyanide to be convenient and useful.

Products used in medicine and medical research are only a few of the many important compounds prepared through organic reactions involving the nitrile (CN) group introduced by sodium cyanide. Acetone cyanohydrin is used in the manufacture of methacrylate resins, and phenylglycine, formed by the reaction of sodium cyanide with formaldehyde and aniline, is used in the manufacture of indigo. With ethylenediamine and formaldehyde, sodium cyanide forms ethylene diamine tetra acetic acid, used as a sequestering agent.

Alkyl halides and esters react with sodium cyanide to form nitriles—a synthesis widely used in the plastics field. The nitriles, in turn, are the starting point for a number of reactions leading to amides, acids, imino ethers, orthoesters, and amines.

While opening up new methods in organic synthesis—particularly in the preparation of drugs and pharmaceuticals—sodium cyanide continues to be of major importance in other industrial fields. Its ability to form complex cyanides with heavy metal salts renders it widely useful in metal treating.

Dissolved sodium cyanide readily reacts with sulfur to form sodium thiocyanate. This reaction is the basis for the use of cyanide as a "sharpening" agent in the unhairing of hides. Sodium thiocyanate, in turn, reacts with organic chlorides to form thiocyanate esters.

High purity sodium cyanide is available from Du Pont in egg, flake and granular form. Find out how you can profit from using sodium cyanide in your manufacturing processes. Mail the coupon below.

Looking ahead with 1,4-Dichlorobutane

In the past, the scarcity of the alpha, omega aliphatic dichlorides has rendered many organic syntheses impractical. Now available in tank-car quantities, 1,4-dichlorobutane makes possible profitable commercial development of many of these syntheses.

The two chlorine atoms of 1,4-dichlorobutane are highly reactive, resembling those of benzyl chloride and allyl chloride. One or both of them may be replaced by thiol, cyanogen, amine, alkoxy, aryloxy or other groups, and the primary reaction products which result are themselves chemical intermediates with many and varied potentialities. The 4-chlorobutyl derivatives, for example, may be useful in Grignard and Friedel-Crafts reactions.

Another interesting intermediate—delta-chlorovaleronitrile—results when 1,4-dichlorobutane is reacted with sodium cyanide. *Saponification* of this product yields sodium delta-hydroxy-valerate, while *hydrolysis* leads to delta-chlorovaleric acid or delta-valerolactone.

Coupling two molecules of delta-chlorovaleronitrile with sodium sulfide gives bis-4-cyanobutyl sulfide, which can be oxidized to the corresponding sulfone, or reduced to give a diamine. Hydrolysis of bis-4-cyanobutyl yields a dibasic acid.

For complete information about 1,4-dichlorobutane, its properties and reactions, mail the coupon.

"Elvanol" produces tough, grease-resistant films

Ordinarily, you wouldn't expect a water-soluble product to be a source of strong, useful films. But "Elvanol" polyvinyl alcohol is the exception. Films made from it are greaseproof, and have high tensile strength, impermeability to gases, and resistance to tearing or puncturing.

These tough, transparent films have a low degree of adhesion to many other plastic materials, making them useful on molds to prevent sticking. The water-soluble "Elvanol" films can be used to package unit quantities of soaps, bath salts and detergent powders; weed killers, etc. Other uses include gas-tight wrappings for polished metal articles; greaseproof wrapping for fatty materials. The transparent, heat-resistant films can be heat sealed or sewed in packaging.

Note: We don't make "Elvanol" films, but if you want more information about a supply source, or about "Elvanol," just check coupon below.

New Epoxidation Technique for natural fats, oils and derivatives

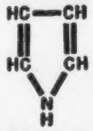
Epoxidation in a *single-stage reaction* is a feature of a new hydrogen peroxide-resin technique developed in the Du Pont Laboratories. Hydrogen peroxide is activated by an exchange resin to increase its efficiency in epoxidation. This process simplifies conversion of natural fats and oils into useful derivatives.

The new method increases epoxy content; lowers by-product formation; eliminates preforming peracid; minimizes acid requirements; lowers residual unsaturation. The epoxy oils produced by this method are heat stable and have good viscosity characteristics.

For a detailed description of this efficient technique, just fill out and mail coupon below.

New Products

Promising Heterocyclic Compounds



PYRROLE

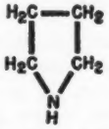
Boiling range.....126.5—131°C.
Sp. Gr. 20°/4°C. ...0.967—0.970
Refr. Ind. N20°/D...1.508—1.51

Pyrrole is slightly soluble in water, miscible with most organic solvents. It is an excellent solvent for cellulose triacetate and for caffeine.

Pyrrole is aromatic in nature, resembling phenol or resorcinol in the many substitution reactions which it readily undergoes. The α-carbon atom is the most reactive position, the hydrogen atom being readily replaced by groups such as aldehyde, acyl, carboxylic acid, alkyl, hydroxymethyl, etc.

Substitution at the other positions can also be readily effected, in addition to reactions which result in opening or expansion of the ring.

PYRROLIDINE



Boiling range.....86—93°C.
Sp. Gr. 20°/4°C.
.....0.857—0.870
Refr. Ind. N20°/D
.....1.4410—1.4440

Pyrrolidine is completely miscible with water and with most organic solvents. It is a basic cyclic secondary amine. Its basicity and wide range of solubilities make it of interest as a reaction solvent and catalyst.

It is a useful intermediate in organic synthesis, readily undergoing substitution, addition, oxidation, and ring opening reactions.

Substitution reactions generally occur at the nitrogen atom, resulting in the formation of tertiary amines. N-formyl, -acyl, -alkyl, -hydroxymethyl, -hydroxyethyl, -cyanomethyl, -cyanoethyl, and many other derivatives can be readily obtained.

For more information send for Bulletins Nos. 27 and 28.

CP-2
E. I. du Pont de Nemours & Co. (Inc.)
11507 Nemours Bldg., Wilmington, Del.

Please send me literature and information on:

- ☐ 1,4-Dichlorobutane
- ☐ "Elvanol" polyvinyl alcohol
- ☐ Epoxidation with H_2O_2
- ☐ Sodium Cyanide
- ☐ Pyrrole
- ☐ Pyrrolidine

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BETTER THINGS FOR BETTER LIVING ...THROUGH CHEMISTRY

Name_____
Title_____
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City_____ State_____

When inquiring check CP 4957 opposite last page

of reactions yield new compounds such as aromatic and aliphatic nitrihydroxy compounds, aromatic amines, dinitroneopentane, alkyl nitronic acids, methazonic acid, mercury fulminate, chloronitroparaffins, β-dioximines, and trialkyl isoxazoles.

As solvents, compounds present an unusual combination of properties: medium boiling range, mild odor, and strong solvent power. Their evaporating rates approximate that of butyl acetate, viscosity characteristics are favorable, and solvents are non-hygroscopic.

Description: Nitromethane, nitroethane, 1-nitropropane, and 2-nitropropane are available in commercial quantities, have these tentative specs:

	Nitromethane
Purity (wt %, min)*	95
Nitroparaffin (total wt %, min)*	99
Sp gr (25/25°C)	1.13
Acidity (wt % as acetic acid, max)	0.1
Water (wt %, max)	0.1
Color (APHA, max)	20
Distillation range (°C @ 760 mm, 90% min)	100-103

(cont'd)

Nitroethane	1-Nitropropane	2-Nitropropane
90	94	94
99	99	99
1.05	1.00	0.99
0.1	0.2	0.1
0.2	0.2	0.1
20	20	20
112-116	129-133	119-122

*Determined by mass spectrometer

Nitroparaffins are mild oxidizing agents. However, the usual safety precautions should be taken when they are subjected to high temperatures and pressures since they may react violently, especially in presence of organics. By avoiding conditions approaching the critical point and by avoiding severe adiabatic compression, the nitroparaffins may be safely handled in quantity.

Flash points and lower-flammability limits of vapor are higher than many commonly used organic solvents. Containing less than 0.2% water, the chemicals are non-corrosive to steel. Prolonged breathing of the vapors should be avoided, even though the chemicals are relatively non-toxic.

(Nitroparaffins are products of Commercial Solvents Corp., Dept. CP, 260 Madison Ave., New York 16, N. Y. Check CP 4958 opposite last page.)

Want a quick "locator" for specific chemical materials discussed in this issue . . . ?

The alphabetical Product Directory (starting on page 217) will give you a handy page reference to all articles and advertisements.

FOAM'S A THIEF

KILL IT *with* DOW CORNING ANTIFOAM AF EMULSION

Now you're the boss! Foam no longer dictates productive capacity, output or processing times as witness these examples:

- ***strawberry concentrate cooling time reduced 25%.***
- ***dairy saves 300-400 gallons of skimmed milk daily.***
- ***yield on textile vat dyes doubled.***
- ***vacuum concentration capacity increased 60%.***

Effective at remarkably low concentrations against the widest variety of foamers, Dow Corning Antifoam A and the more easily dispersed Antifoam AF Emulsion are physiologically harmless; pay for themselves many times over because they ● ***eliminate the waste and fire hazard of boil-overs*** ● ***reduce processing times*** ● ***save the space previously wasted on foam in process equipment***

see for yourself!
mail coupon TODAY for free sample

DOW CORNING SILICONES
Dow Corning Corporation
Midland, Mich., Dept. 3202

Please send me data and a free sample of
☐ Dow Corning Antifoam A
or ☐ Dow Corning Antifoam AF Emulsion

NAME_____
COMPANY_____
ADDRESS_____
CITY_____ ZONE___ STATE_____

When inquiring check CP 4959 opposite last page

CHEMICALS FOR INDUSTRY

Uniform quality . . . The key to the superior Chemicals for industry produced by the Tennessee Corporation. As basic producers, we maintain exacting quality control from the raw materials to the finished product that bears our label.

COPPER SULPHATE
MANGANOUS OXIDE
MONOHYDRATED MANGANESE CARBONATE
COPPER SULPHATE
FERRIC SULPHATE
COPPER CARBONATE
SULPHUR DIOXIDE
COPPER HYDRATE
MONOHYDRATED ZINC SULPHATE
CUPRIC CHLORIDE
CUPRIC OXIDE
CHLOROSULPHONIC ACID
MANGANESE SULPHATE
ORGANIC SULPHONIC ACIDS (AND DERIVATIVES)
MONOHYDRATED MANGANESE SULPHATE

Samples, Specifications and Detailed Information Available Upon Request.

TENNESSEE TC CORPORATION

617-629 Grant Building, Atlanta, Ga.

When inquiring check CP 4960 opposite last page

Used as vehicle, silicone resin

imparts heat-resistance to protective coatings

Resin balances cure rate with flexibility and hardness; can be used in aluminum and colored formulations with high gloss

Specifications of SR-111 Silicone Resin

Solids content (%)	50 ± 1
Sp gr (@ 25°C)	1.01
Viscosity (cp @ 25°C)	50-100
Color (Gardner, max)	6
Storage stability (months, min)	6
Flash point (closed cup, °F)	40

Uses: As a vehicle for use in formulating heat- and weather-resistant protective coatings for smokestacks, ovens, incinerators, exhaust manifolds, space heaters, and jet engine components. It is recommended for aluminum finishes for service at 300-1000°F, and when properly modified, for colored finishes for service at 300-600°F.

Features: Resin combines outstanding heat resistance with excellent balance of cure speed, flexibility, and hardness. Initial gloss and gloss retention are high. Good compatibility with organic and other silicone resins allows paint formulators greater flexibility in their choice of modifiers. SR-111 can be modified to yield improved initial film hardness and toughness, and to produce films having a wide range of hardness, flexibility, and curing characteristics.

Tests have shown that colored formulations based on this resin show no color change and retain most of their initial gloss for more than ten weeks at temperatures up to 500°F on both steel and aluminum. Pigmented with aluminum and applied on clean steel, finishes will withstand long exposure at 1000°F with repeated chilling and reheating — even in presence of flue gases. In outdoor exposure tests in Florida, colored finishes based on similar silicone resins have shown no chalking, cracking, or checking after four years at a 45° angle.

Description: Designated SR-111, the silicone resin is supplied as a 50% solution in toluene. Thinners can be toluene, xylene, mineral spirits, or other solvents having Kauri Butanol values greater than 50. The resin is compatible with ethyl cellulose, methacrylates, chlorinated diphenyls, melamine formaldehydes, urea formaldehydes, alkyds, phenolics, and other silicone resins.

Two general formulations are suggested as starting points. Addition of solvent to obtain partially reduced paints is recommended for good shelf life. Resin wets pigment very well and usual dispersion techniques may be used. Pigments should be able to withstand high curing and service temperatures.

Heat-resistant Aluminum

SR-111 solution (% by wt)	75.00
Aluminum paste*	22.29
Xylene	2.71
	100.00

*Reynolds No. 3A or No. 30
Alcoa No. 230 or No. 205 or equivalent

Gloss White Enamel (Baking)

SR-111 solution (% by wt)	83.30
Titanox RA	16.70
	100.00

Add 0-0.5% zinc octoate depending on curing and service requirements

Best known catalyst is zinc octoate, which causes no discoloration and gives good stability. Zinc naphthenate can be used when color retention at high temperatures is not important. Based on resin solids, 0.5% zinc metal is recommended. Driers and pigments containing lead, and cans having soldered seams, should be avoided, since lead induces rapid gelation of the resins and greatly reduces package stability.

To develop optimum properties, films should be baked at temperatures higher than 400°F. Suggested baking cycles range from 40-60 min @ 500°F to 2-3 hr @ 400°F.

(Silicone resin for paints is a product of Silicone Products Dept., General Electric Co., Dept. CP, Waterford, N. Y. . . . or for more information check CP 4961 on handy form opposite last page.)

Offers polyethylene in easy-to-use pellet form

Pellets flow easily from hoppers into machines; low bulk factor cuts storage requirements

Polyethylene in spherical pellet form presents many advantages in molding and extrusion. Pellets flow more uniformly from hopper into heating cylinder, reducing chance of bridging-over.

Easy to keep clean in storage and use, pellets' smooth spherical surface will not readily catch or hold

Spherical pellets of polyethylene flow easily

dust or foreign particles. It is estimated that they have a 10% lower bulk factor, thus requiring less storage area. Because of fewer fines, it is easier to clean hopper of machine when changing color.

(Tenite Polyethylene is a product of Eastman Chemical Products, Inc., Subsidiary of Eastman Kodak Co., Dept. CP, 260 Madison Ave., New York 16, N.Y. Check CP 4962 opposite last page.)

Covers casein production

Production of casein from wet curd, skim milk, and foreign and domestic dry casein is described in illustrated eight-page bulletin.

Bul P-19-70-0-4-54 is available from The Erie Casein Dryers, Dept. CP, 500 Main St., Erie, Ill. Specify CP 4963 opposite last page.

NEED A "POWERFUL" SOLVENT?

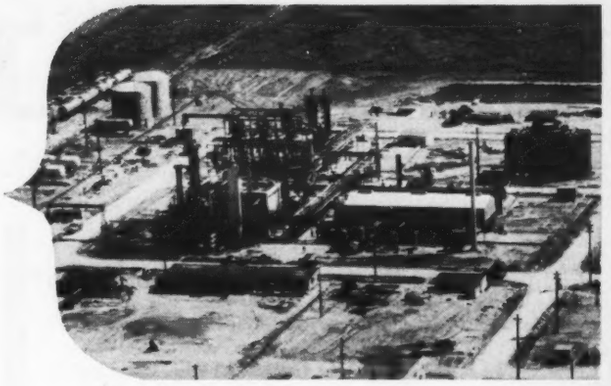
AN OUTSTANDING DEHYDRATING AGENT?

A SUPERIOR HUMECTANT?

...specify High Purity

NITROGEN DIVISION ALLIED CHEMICAL

Diethylene Glycol



USES—

- **Selective solvent for separating aromatic petroleum distillates**
- **Dehydrating agent for natural gas in pipelines**
- **With ethanolamines, to desulfurize and dehydrate natural gas stocks**
- **Hydraulic fluid base**
- **Compounding of GR-S synthetic rubber**
- **Lubricant in gas meters**

Your dollar buys more humectancy and solvent power with diethylene glycol! Because of its ether linkage, it is superior to many polyols as a solvent for resins, dyestuffs and proteins. This solvent power combined with a high boiling point and low viscosity gives diethylene glycol an unequalled range of usefulness.

Now in production at the world's newest and most modern petrochemicals plant! Shipments are available in drums, tank trucks and 4, 6, 8 and 10,000-gallon tank cars.

Write for further details and samples. A technical representative will call, if you wish. No obligation!

Also: High Purity

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heat transfer medium
hydraulic fluid
for use in antifreeze

Triethylene Glycol...
dehydration of natural gas
heat transfer medium
as a solvent in production of resins and plasticizers
diesel fuel additives

Ethylene Oxide...
oil additives, lubricants,
oil emulsion breakers and in
polyglycols, ethanolamines

Anhydrous Ammonia • Ammonium Sulfate • Ammonia Liquor
Methanol • Sodium Nitrate • Ethanolamines • Ethylene Oxide
Ethylene Glycol • Diethylene Glycol • Urea • U.F. Concentrate–85
Nitrogen Tetroxide • Nitrogen Solutions • Formaldehyde
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When inquiring check CP 4964 opposite last page

Harshaw

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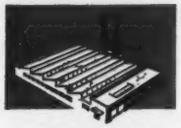
chemicals



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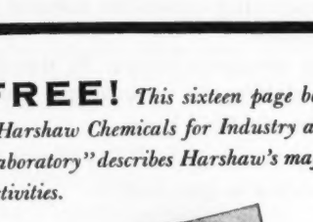
Laboratory Instruments
Apparatus and Chemicals

FREE! *This sixteen page book "Harshaw Chemicals for Industry and Laboratory" describes Harshaw's major activities.*



The **HARSHAW CHEMICAL** *Co.*
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HARSHAW SCIENTIFIC
Division of The Harshaw Chemical Co.

Cleveland • Cincinnati • Detroit • Houston
Los Angeles • Philadelphia

When inquiring check CP 4965 opposite last page

Straight-line production of quality latex paint easy with vehicle . . .

only pigmentation, viscosity adjustment, drier addition are required

Uses: As an emulsion vehicle for inside flat wall paints. Should be used without further modification to make quality paints.

Features: Vehicle is complete, and requires only pigmentation, viscosity adjustment, and drier addition. An involved step-wise procedure is not required. Standard plant equipment and procedures similar to conventional oil-based products can be used.

Description: A combination of synthetic and oleoresinous polymers, Cargill EVT-50 is an opaque white liquid of 46% solids (±non-volatile). Apparent weight per gallon is 7.5 lb; pH is approximately 9.0; viscosity is 110-130 KU. A suggested interior flat white paint formulation is given:

	Lb/100 gal
Titanox RA50[1]	239
Velveteen Silica "R"[2]	95
Water (tap)	164
R & R 551[3]	6.5
Blancol soln. (20% in water)[4]	6.5

1 Titanium Pigment Corp.
2 Tamms Industries
3 Ross and Rowe, Inc.
4 Antara Chemical Division, General Aniline & Film Corporation

Add pigments to water containing 551 and Blancol in pebble mill and grind for 2-3 hr. For high speed or roller mills, hold part of water for heavier consistency in premix.

Cargill EVT-50	430
Lead naphthenate (24%)	3.7
Cobalt naphthenate (6%)	1.9
Water (tap)	125

Dump grind into thindown tank, add EVT-50 and mix, avoiding air entrainment. Add driers while mixing. Mix at least ½ hr before adding thindown water, and mix again for ½-1 hr.

Paint Properties	
PVC (%)	32.1
Non-volatile (%)	50.8
Wt per gal (lb)	10.8
Viscosity (KU)	63-70
pH	8.4-8.8

(Emulsion vehicle for paints is a product of Vegetable Oil Division, Cargill, Incorporated, Department CP, 200 Grain Exchange, Minneapolis 15, Minnesota . . . or for more information concerning manufacturer's product reader may simply check CP 4966 on the convenient Reader Service slip which is located opposite last page.)

Hydrophilic colloids for thickening, stabilizing

Uses: Thickening, stabilizing, and gel- or film-forming properties give it use in pharmaceuticals, plastic and rubber coatings, and the textile industry.

Features: Salts gave a high degree of polymerization, are very exactly graded, and are absolutely free of calcium.

Description: Sodium, ammonium, and potassium salts of alginic acid are among those available. The acid is extracted chemically from brown Norwegian seaweed.

(Protan alginates are distributed by Croda, Inc., Dept. CP, 51 Madison Ave., New York 10, N.Y. . . . or for more information check CP 4967 on handy form opposite last page.)

Fatty acid for cosmetics has 80°C melting point

Uses: In cosmetic formulations where a higher melting fatty acid is desired.

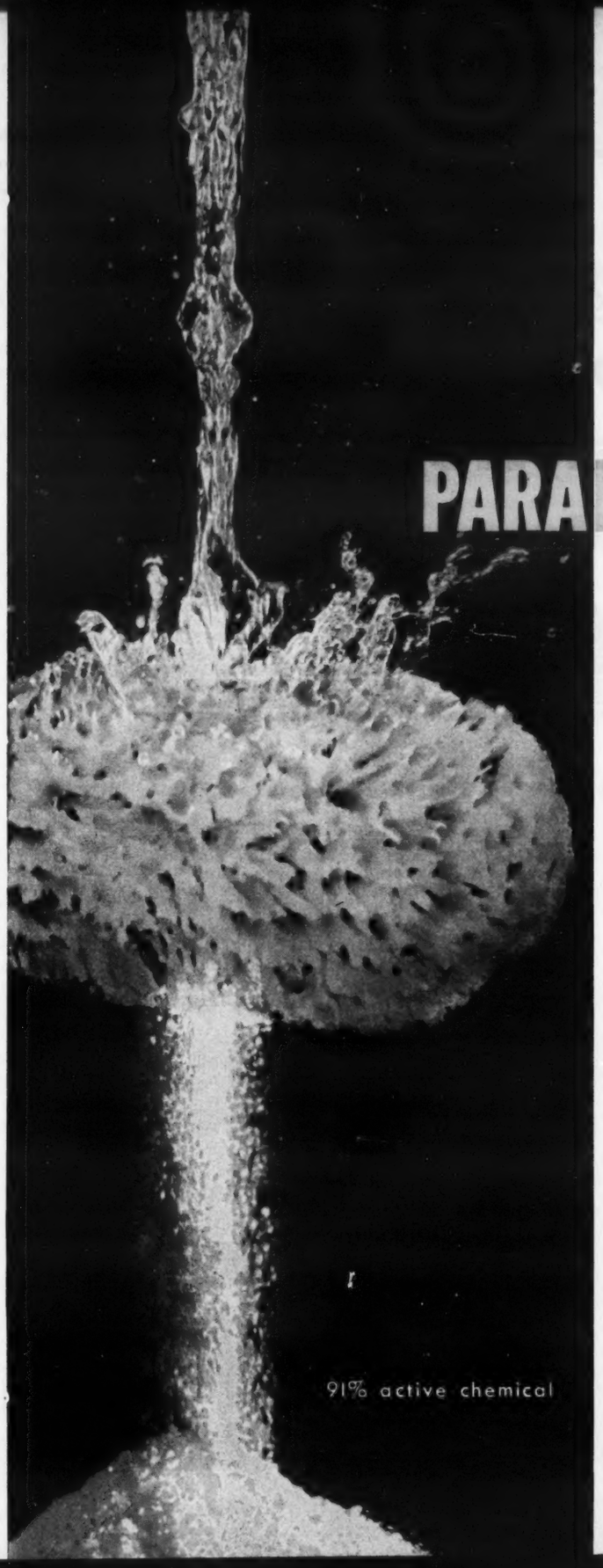
Features: Material has a melting point of 80°C.

Description: Behenic acid, $C_{22}H_{44}O_2$, is a white, wax-like solid in flake form. Specifications are as follows:

Acid value	160-165
Iodine value (max)	3
Saponification value	160-165
Unsaponifiable matter (% max)	3
Mean molecular weight	335-340

(Behenic acid is a product of Aceto Chemical Co., Inc., Dept. CP, 40-40 Lawrence St., Flushing 54, N.Y. . . . or for more information check CP 4968 on handy form opposite last page.)

For more information on product at right, specify CP 4969 . . . see information request blank opposite last page.



formaldehyde isn't "formaldehyde" any more . . .

For high solids resins it's Celanese*

PARAFORMALDEHYDE

Produce more with your present equipment . . .

- **30% larger batches—water bulk eliminated**
- **⅓ shorter cycles—reflux and dehydration steps cut by hours**
- **greater reactivity, higher yields—lower formaldehyde-to-phenol ratio**

Get your Celanese representative to show you how this shortcut to lower costs and greater resin production can fit your operation. Or write for Technical Bulletin N-30.

Celanese Corporation of America, Chemical Division, Dept. 591-B, 180 Madison Avenue, N. Y. 16.

PLANNING ADDITIONAL INSTALLATION?

You can reduce capital investment by using Celanese Paraformaldehyde. No need for heated storage tanks or large storage area. Same output from smaller kettles; lower steam, electricity and cooling costs.

Celanese® CHEMICALS

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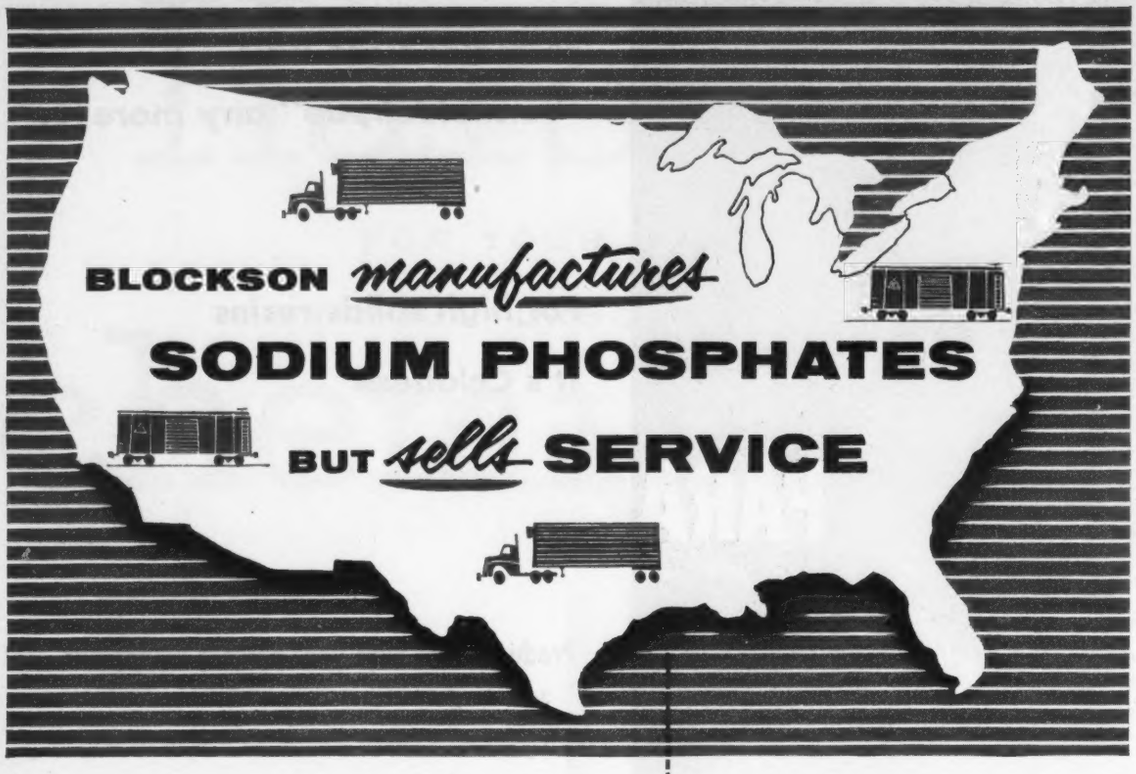
ONLY CELANESE OFFERS THE RIGHT FORMALDEHYDE FOR EVERY PURPOSE . . .
PARAFORMALDEHYDE • FORMCEL* SOLUTIONS
FORMALIN • TRIOXANE



THERE is a reason for the very substantial tonnage of sodium phosphates Blockson ships to industrial areas far from our greatly expanded plant facilities here in Joliet. That reason is continuous prompt shipment—a few bags or many carloads—minus the red tape usually associated with an operation as large as ours.

Again and again customers tell us they couldn't get better service if our plant were located in their own industrial community.

There is a reason for that, too. At Blockson, production and sales are so closely coordinated that a single collect phone call is all that is required to expedite your unforeseen needs and get your sodium phosphates en route the very same day if it is humanly possible, and most frequently it is.

We welcome the responsibility of functioning as an arm of our customers' production setup, minimizing their inventory and warehousing expense, timing and dovetailing dependable shipments with their own processing operations and at all times providing a uniform and dependable competitively priced product—readily available in your required granulations and specifications.

The new Blockson catalog and handbook is yours for the asking.

BLOCKSON CHEMICAL COMPANY
Joliet, Illinois

- *Sodium Tripolyphosphate*
- *Trisodium Phosphate*
  CRYSTALLINE • MONOHYDRATE
- *Tetrasodium Pyrophosphate*
  ANHYDROUS
- *Sodium Polyphos*
  (SODIUM HEXAMETAPHOSPHATE)
  (SODIUM TETRAPHOSPHATE)
- *Sodium Acid Pyrophosphate*
- *Trisodium Phosphate Chlorinated*
- *Disodium Phosphate*
  ANHYDROUS • CRYSTALLINE
- *Monosodium Phosphate*
  ANHYDROUS • MONOHYDRATE

- *Sulfuric Acid*
- *Sodium Fluoride*
- *Sodium Silicofluoride*
- *Hygrade Fertilizer*
- *Teox 120*
  NONIONIC SURFACTANT

BLOCKSON

When inquiring check CP 4970 opposite last page

Aids both high and low temperature physical properties when blended with organic rubbers

Uses: Rubbery parts with properties intermediate between those of silicone rubber and organic rubbers can be produced by blending this product in any proportion with organic rubbers.

Features: Silicone gum can be vulcanized with sulfur. Unusually compatible, it blends with or is applied as a protective coating to organic rubbers. When compounded with organic rubbers, fillers, and sulfur vulcanizers, it covulcanizes to yield rubbery products that are serviceable over a temperature range from −70° to 400°F and resist weathering.

Description: Clear and colorless, 410 Gum is a high viscosity, high molecular weight silicone polymer. Specific gravity is 0.98; Williams plasticity is 45 mils.

Compounding Gum Alone

Properties of finished parts are determined to a large extent by fillers used. Following formulation indicates physical characteristics obtainable.

Formulation	
410 Gum	100 parts
Hi-Sil 303	40 parts
Methyl tuads	3 parts
Captax	0.5 parts

Typical Properties (20 min cure @ 320°F)	
Tensile strength (psi)	850
Elongation (%)	325
Durometer (Shore A)	63
Brittle point (°F)	−80

Compounding Gum with Organic Rubber

Properties of the blends are intermediate to those of silicone rubber and organic rubber. In general, 410 Gum lowers the brittle point of high temp organic rubbers and increases their high temperature resistance. With low temp organic elastomers, it raises high temp serviceability and enhances low temp characteristics. It increases resistance to oxidation, hot oils, corona, ozone, and weathering.

Formulation	Parts	
Butyl GRI-15	100	90
410 Gum	-0-	10
Statex 125	50	50
Zinc oxide	3	3
Sulfur	2	2
Ethyl selenac	2	2
Captax	1	1

Typical Properties (30 min cure @ 320°F)		
Tensile strength (psi)	2400	1940
Elongation (%)	460	403
Durometer (Shore A)	61	59

(Silicone gum is a product of Dow Corning Corp., Dept. CP, 592 Saginaw Rd., Midland, Mich. . . . check CP 4971 on form opposite last page.)

Fungicidal properties shown by compound

Uses: Chemical has shown promise as a fungicidal seed protectant.

Features: It has excellent fungitoxic properties, and sufficient volatility. Preliminary tests on rats and rabbits show a low degree of oral toxicity.

Description: Called B-856, 1,3-dichloro-5,5-diphenylhydantoin is a white to near-white, free-flowing solid with a melting point of 164-166°C. With mild chlorine-like odor, it is essentially insoluble in water, but quite soluble in several organic solvents. Compound is a mild oxidizing agent.

(Fungicide is a product of Ethyl Corp., Dept. CP, 100 Park Ave., New York 17, N.Y. Check CP 4972 opposite last page.)

Large surface area and high porosity in carbon blocks . . .

offers impregnation possibilities, use as filter plates

Uses: Offers engineering possibilities for impregnation or for use as filter plates.

Features: Highly porous, carbon has extremely fine grain and has high electrical conductivity, chemical resistance, and high temperature stability. Material has a large carbon surface area.

Description: Porous carbon is supplied in blocks or sheets up to approximately 10 x 10 inches, and in thicknesses up to 1½ inches. Air content is 75%.

(Porous carbon is a product of Stackpole Carbon Co., Dept. CP, St. Marys, Pa. For more information write directly to manufacturer on letterhead.)

For more information on product at right, specify CP 4973 . . . see information request blank opposite last page.

DAVISON BULLETIN

LIGHT AS A FEATHER **SYLOID 244®**

Syloid 244 is a highly porous pure silica gel of extremely low density. A free-flowing white powder, it appears as a fluffy snow weighing 4-4.5 pounds per cubic foot as shipped. Syloid 244 has an apparent particle size of 2-3 microns, yet individual particles are predominantly below one micron.

The chemical and physical characteristics of Syloid 244 makes it adaptable for many uses including the following:

- anti-blocking of clear plastic film
- an additive to inks for quick-drying
- a vinyl flatting agent
- anti-caking for powdered products
- thickening agent for salves, lubricants and plastigels

Progress Through Chemistry

DAVISON CHEMICAL COMPANY
Division of W. R. Grace & Co.
Baltimore 3, Maryland

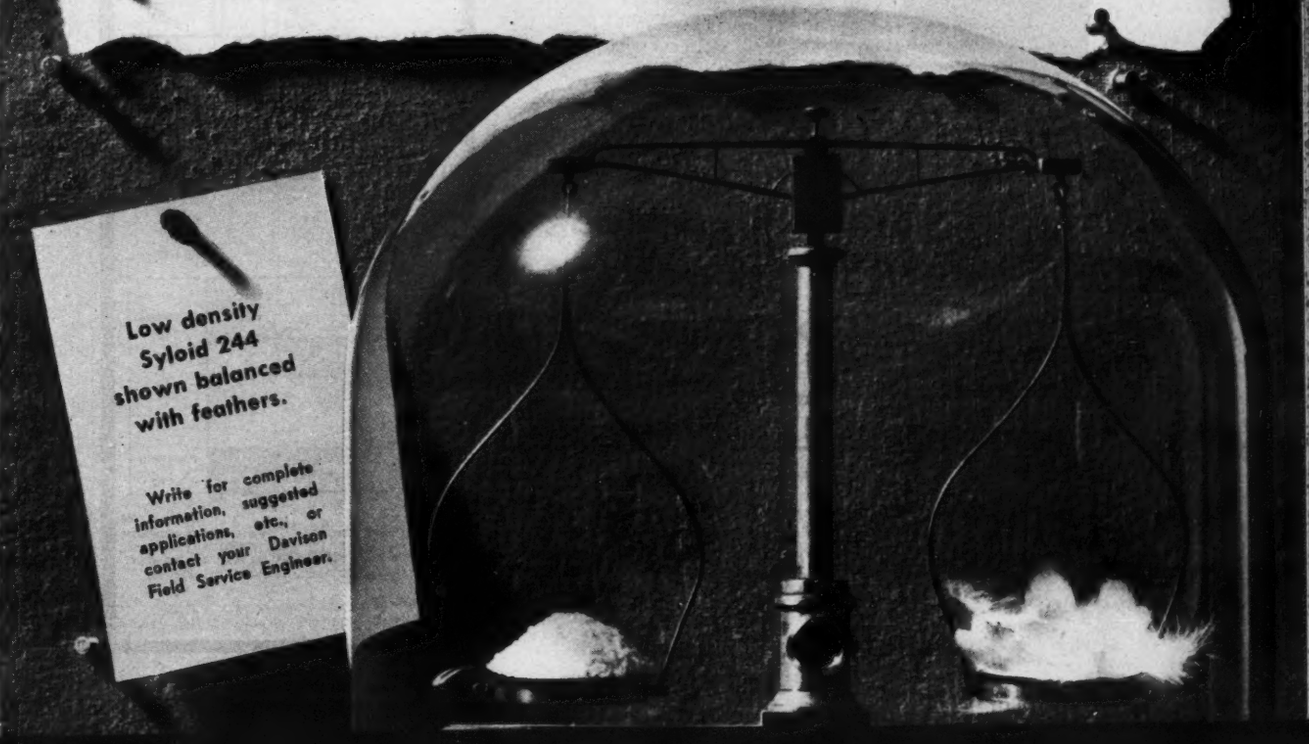
Producers of: Catalysts, Inorganic Acids, Superphosphates, Triple Superphosphates, Phosphate Rock, Silica Gels and Silicofluorides. Sole Producers of DAVCO® Granulated Fertilizers.

TYPICAL CHEMICAL AND PHYSICAL CHARACTERISTICS OF SYLOID 244

Color	white, 94 Hunter reflectometer; transparent in vehicles
Appearance	uniform, free-flowing powder
Density	
as shipped	4-4.5 lbs./cu. ft.
centrifuged in toluol	7.5 lbs./cu. ft.
true (specific gravity)	2.1-2.2
pH	7.2
Silica as SiO_2 (dry basis)	99.5%
Oil adsorption	240 lbs. oil/100 lbs. SiO_2
Surface area (nitrogen)	292 M_2/gram

PARTICLE SIZE DISTRIBUTION BY WEIGHT
(water sedimentation)

5%	less than 1.1 microns
10	1.4
20	2.0
40	3.0
50	3.7
60	4.5
80	7.0


Low density Syloid 244 shown balanced with feathers.
Write for complete information, suggested applications, etc., or contact your Davison Field Service Engineer.

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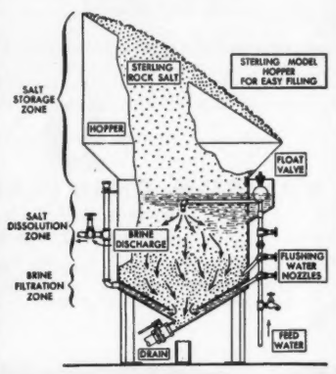
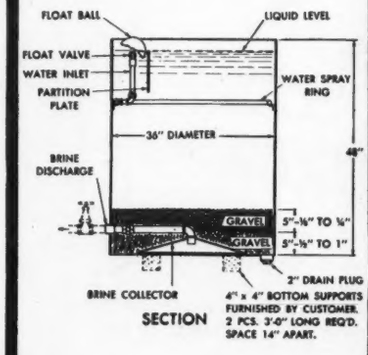
The great mines . . . the refineries . . . the years of teamwork with all brine-using industries . . . enable International to provide the equipment, methods and know-how to make better brine at lower cost with greater efficiency . . . in any plant . . . for any industry.

THE STERLING MODEL LIXATE ROCK SALT DISSOLVER



THE STERLING EVAPORATED SALT DISSOLVER



SECTION

From Sterling Rock Salt or Evaporated Salt

BRINE, AUTOMATICALLY MADE

. . . ALWAYS SATURATED

. . . PIPED TO ALL POINTS OF USE

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INTERNATIONAL SALT COMPANY, INC.
INDUSTRIAL DIVISION • SCRANTON 2, PA.

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ENGINEERING OFFICES: Atlanta, Ga. • Chicago, Ill. • Buffalo, N. Y.

When inquiring check CP 4974 opposite last page

Vulcanized vegetable oil products for use in rubber formulations

Vulcanized vegetable oils, non-thermoplastic resilient solids apparently having a highly cross-linked or branched molecular structure, are subject of eight-page bulletin. Used in rubber formulations, manufacturer's Brown Rubber Substitutes, White Rubber Substitutes, and Modified Brown Rubber Substitutes are described both in text and tables.

"Vulcanized Vegetable Oils" is issued by The Carter Bell Mfg. Co., Dept. CP, Springfield, N. J. When inquiring specify CP 4975 on handy form opposite last page.

Compound undergoes reactions involving chlorine atom on benzene ring

Uses: Monochlorobenzene is used in the insecticide industry in the manufacture of DDT. It is also an intermediate for phenol, aniline, picric acid, and dyes. In addition, chemical finds use as a solvent and as a heat transfer medium.

Features: Highly versatile, the compound undergoes reactions involving the chlorine atom on the benzene ring. It is less toxic than benzene.

Description: Monochlorobenzene, a colorless liquid, is soluble in alcohol, benzene, chloroform, and ether, and is insoluble in water. It has a boiling range (5-95%) of 1.0°C, including 132.0°C.

(Monochlorobenzene is a product of Wyandotte Chemicals Corp., Dept. CP, Wyandotte, Mich. . . . Check CP 4976 on handy form opposite last page.)

Introduces cyanoethyl group, plays key role in synthesis of acrylonitrile

Uses: Preparation of antioxidants, pharmaceuticals, dyes, emulsifying agents, and solvents. Important intermediate in synthesis of acrylonitrile, polyacrylic acid, and other acrylic derivatives.

Features: Compound undergoes reactions of both primary alcohol and aliphatic nitrile. Under controlled conditions, reaction of nitrile group can be carried out without affecting hyroxyl group.

Description: Ethylene cyanohydrin is commercially available in tank car, tank truck or drum carload quantities.

(Ethylene cyanohydrin is manufactured by Carbide & Carbon Chemical Co., Div. of Union Carbide & Carbon Corp., Dept. CP, 30 E. 42nd St., New York 17, N.Y. Check CP 4977 opposite last page.)

ADVERTISEMENT—*This entire page is a paid advertisement* *Prepared by U. S. Industrial Chemicals Co.*

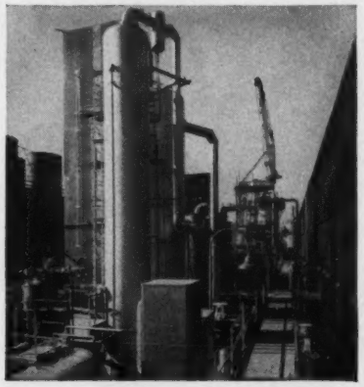
U.S.I. CHEMICAL NEWS

Jan.-Feb. ★ A Series for Chemists and Executives of the Solvents and Chemical Consuming Industries ★ 1955

NEW NATIONAL DISTILLERS' AMMONIA PLANT NOW ON STREAM

Capacity of 60,000 Tons Per Year to Help Meet Growing Needs of Midwest Agriculture, Industry

January 21 marked the opening of National Distillers' new $7 million synthetic ammonia plant at Tuscola, Illinois—the most recent step in National's long-range program of growth and development in the chemical field. This new plant which will produce ammonia from "off-gas" from a hydrocarbon cracking operation, is the largest of its kind in the United States. It will have a capacity of 60,000 tons of ammonia per year by mid 1955 and will produce anhydrous ammonia and a variety of nitrogen solutions for the expanding agricultural and industrial markets of the Midwest.



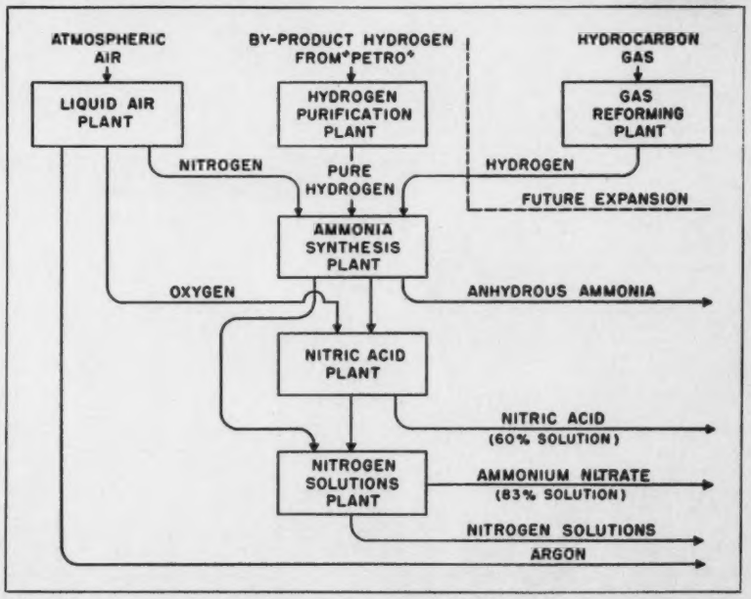
Shown here are the nitrogen wash column and the cold box of the air separation unit.

Uses By-Product Hydrogen

While hydrogen for most ammonia plants is obtained through "reforming" of natural gas, National Distillers has a ready-made source of supply — a hydrogen-rich "off-gas" from cracking operations at National Petro-Chemicals Corporation's ("Petro") huge ethylene plant located on adjacent property.

Nitrogen is obtained by air liquifaction and fractionation, with by-product oxygen being used in other processing operations. Studies by National's technical staff indicate that the use of by-product hydrogen is more economical than decomposition of natural gas from a standpoint of capital investment and production costs.

MORE



Simplified flow diagram of the National Distillers' synthetic ammonia plant in Tuscola, Ill.

National Distillers Announces 3 Appointments In Chemical Division

Three appointments highlighting the integration of all National Distillers Products Corporation chemical activities into one division were announced this month by Dr. Robert E. Hulse, Director of the Chemical Division, and a Vice President of both National Distillers Products Corporation and of its subsidiary, National Petro-Chemicals Corporation.

Lee A. Keane, Vice President of U. S. Industrial Chemicals Co., Division of National Distillers Products Corporation, has been named Director of Chemical Sales, and will be in charge of the sales of all the corporation's chemical products.

Robert H. Cornwell has been appointed Director of Production, and will be responsible for production activities of all chemical plants of the corporation and its subsidiaries.

Dr. Stuart Schott has been named Director of Research, and will be in charge of the research division which will conduct research and pilot plant operations for the entire corporation and its subsidiaries.

New "Argon Grade" of Metallic Sodium Seen Key to New Metals

"Argon Grade" Metallic Sodium is a recently developed form of sodium which is produced, specially filtered and packed in an atmosphere of argon gas. Sodium protected in this manner is recommended for use where traces of dissolved gases such as oxygen and nitrogen are undesirable.

Development and commercial availability of this new product have been announced by the Chemical Division of National Distillers Products Corporation. This is the most recent step in National's program for developing forms and grades of metallic sodium which are easy to use and acceptable for a wide scope of industrial applications. Typical of this pioneering are earlier announcements on Sodium Dispersions and High Surface Sodium for many other uses.

For years the metal industry has benefited from the use of metallic sodium as a reaction tool. Used in an early commercial process for aluminum and more recently for rapid, efficient descaling operations in the production of stainless steel and other metals, sodium today points the way to new or improved methods for producing titanium, zirconium, silicon, tantalum, hafnium, etc. With the help of this versatile element, ductile metal and finely divided metal powder catalysts can be made from metal salts and oxides. For more information on adapting sodium to your needs, write Editor, U.S.I. Chemical News.

CONTINUED

New Ammonia Plant

Nitrogen Solutions

The nitrogen solutions are obtained by converting a part of the ammonia to nitric acid. The nitric acid is reacted with more ammonia to yield ammonium nitrate solutions. A variety of nitrogen solutions will be "custom-made" to satisfy the customer's requirements with respect to nitrogen content.

Nitrogen solutions are used in the manufacture of finished fertilizer and also for direct

Ammonia converter installation at National's new 60,000 ton a year ammonia plant.

application to the soil. National has storage facilities for anhydrous ammonia and nitrogen solutions to take care of some seasonal fluctuations in the demand for these products.

More Nitrogen Fertilizer Used

Consumption of fertilizer nitrogen is increasing enormously in all Midwestern states, and by 1955 demand in this area is expected to exceed 300,000 tons, according to the U.S. Department of Agriculture. Tuscola, Ill., is located in the heart of this rich farming region and makes an ideal site for National's new plant — the first of its kind in that state.

Higher Yields

According to authoritative agricultural reports, an average of 10 pounds of nitrogen per acre was used in the corn growing areas during 1950. With this level of fertilizer nitrogen, the average yield was 42 bushels per acre. According to these reports, application of 40 pounds of nitrogen instead of 10 increased the yield by 13 bushels per acre. At average farm prices this extra 30 pounds of nitrogen produced a profit over increased fertilizer costs of $15.75 per acre or 420% return.

Increased use of fertilizer nitrogen gives proof that farmers and farm leaders are becoming increasingly aware of the profitability of higher nitrogen levels in fertilizer programs. National Distillers' facilities for producing raw materials for the fertilizer industry assures the Midwest of a dependable source of supply to meet these demands.

Emphasis on Raw Materials

In addition to the new ammonia plant, National has four Midwestern sulfuric acid plants with a combined capacity of over 1,000 tons of acid a day, much of which goes to the fertilizer industry. This is in keeping with National's intent to place greater emphasis on bulk industrial chemicals and to expand operations where the company has competitive advantages by virtue of low cost, integrated facilities, well situated as to markets. In addition, National has strongly emphasized that its policy is to produce *raw materials* for the fertilizer industry — not to manufacture finished fertilizer.

For further information on National Distillers' fertilizer chemicals write to Editor, U.S.I. Chemical News.

New Light on Methionine Boost to Fish Meal Rations

During recent studies on sulfur bearing amino acids, indole was found to have a growth-retarding effect on the animals tested. However, the researchers also found, that methionine conjugated or combined with indole in such a way as to render this growth-retarding action ineffective. Since high levels of indole are present in fish meal and its products of digestion, this deactivation of indole is thought to explain the beneficial effects obtained when methionine is added to rations containing high levels of fish meal. Indole and other types of toxic putrefactive compounds are built up in fish products when decomposition sets in before processing.

TECHNICAL DEVELOPMENTS

Information about manufacturers of these items may be obtained by writing U.S.I.

A wide-spectrum "ideal" chemical (ethyl carbamate) with applications ranging from cancer therapy to the manufacture of plastics, reacts with organic and inorganic compounds to form intermediates or end products of commercial importance. **(No. 1070)**

Making corrugated cases easy to open, is the advantage of a new adhesive which seals cases securely during shipment and handling but still permits opening without struggle or use of knife. **(No. 1071)**

Moisture content of chemicals, clay, putty, and certain foods can be determined in less than 30 seconds according to the manufacturer of a new moisture tester. **(No. 1072)**

A floor tile with built-in adhesive on the back has been especially designed for do-it-yourself enthusiasts. Just strip off a plastic film and put the tile in place. **(No. 1073)**

Filtering compound for ultraviolet light, is reported to be particularly useful for sun-screen cosmetics. Safe for use on the skin, it is chemically stable, stable to ultraviolet light, and has excellent solubility. **(No. 1074)**

New lifting device for nonporous materials such as sheet metal, plate glass, etc., uses a vacuum cap that attaches to the moving object. Compressed air operating the hoist also creates the vacuum. **(No. 1075)**

A grease thickener said to make greases stand up better under high and low temperature operating conditions has been announced. Greases made with the new thickener have been boiled in water for days without breaking down. **(No. 1076)**

Oil for flushing mechanical vacuum pumps with-risk of contamination from detergents or volatile additives is said to be ideal for removing old oil, sediment, and dirt which accumulates in the pump mechanism. **(No. 1077)**

Paint stripping and decarbonizing solvent works by cold immersion, is self-emulsifying, and according to the manufacturer, it strips paint and primers and cleans carbonaceous tars, coke and carbon varnish. **(No. 1078)**

New liquid metals pump has been developed which has no moving parts, uses electric current to do the pumping. As the current moves through the metal, it pushes the metal forward. **(No. 1079)**

PRODUCTS OF U.S.I.

ALCOHOLS
Butanol (Normal-Butyl Alcohol)
Fusel Oil — Refined

Ethanol (Ethyl Alcohol)
Specially Denatured—all regular and anhydrous formulas
Completely Denatured—all regular and anhydrous formulas
Pure—190 proof U. S. P., Absolute—200 Proof
Solox*—proprietary solvent—regular and anhydrous

ETHERS
Ethyl Ether, U. S. P.
Ethyl Ether, Absolute—A.C.S.

ACETONE—A.C.S.

ANSOLS
Ansol* M
Ansol* PR

ACETIC ESTERS
Butyl Acetate
Ethyl Acetate—all grades
Normal-Propyl Acetate

OXALIC ESTERS
Diethyl Oxalate

OTHER ESTERS
Diatol*
Diethyl Carbonate

INTERMEDIATES
Acetoacetanilide
Acetoacet-ortho-chloroanilide
Acetoacet-ortho-toluidide
Acetoacet-para-chloroanilide
Ethyl Acetoacetate
Ethyl Benzoylacetate
Ethyl Sodium Oxalacetate

FEED PRODUCTS
Calcium Pantothenate (Feed Grade)
Choline Chloride Products
Curbay B-G* 80
DL-Methionine (Feed Grade)
Niacin, U.S.P.
Riboflavin Concentrates
Special Liquid Curbay*
U.S.I. Vitamin B_{12} and Antibiotic Feed Supplements
Vacatone* 40
Vitamin A, D_3, and K_3 Products

OTHER PRODUCTS
Anhydrous Ammonia
Caustic Soda
Ethylene
Liquid Chlorine
Metallic Sodium
DL-Methionine (Pharm.)
N-Acetyl DL-Methionine
Nitrogen Solutions
Propionic Acid
Sulfuric Acid
Urethan, U.S.P.

*Reg. U.S. Pat. Off.

U.S.I. INDUSTRIAL CHEMICALS CO.
Division of National Distillers Products Corporation
99 PARK AVENUE, NEW YORK 16, N. Y. BRANCHES IN ALL PRINCIPAL CITIES

Stabilizer overcomes plating troubles encountered with Ba-Cd laurate stabilizers in high ratios . . .

gives good results in compounds containing heat-sensitive organic pigments

Uses: As a heat and light stabilizer in vinyl compositions, especially when ester or phosphate plasticizers are used.

Features: Stabilizer was especially developed to overcome plating difficulties encountered with barium-cadmium laurate stabilizers when they are used in high ratios. It also gives good stabilization in compounds containing heat-sensitive organic pigments, especially the red types. Stabilizer is very effective in formulations containing high percentages of phosphate plasticizers.

Description: Advastab C-77 is a complex organic cadmium stabilizer which does not contain fatty acids such as lauric acid. Supplied as a clear, straw-colored liquid, its specific gravity is 1.057. It is soluble in the usual plasticizers and solvents used in the vinyl industry. Usual dosage is 2-4%, based on resin content.

(Stabilizer for vinyls is a product of Advance Solvents & Chemical Corp., Dept. CP, 245 Fifth Ave., New York 16, N.Y. . . . or for more information check CP 4978 on handy form opposite last page.)

Spent sulfite liquor used to produce nucleic acid

Important in studies of cell growth and aging, nucleic acid is being produced on commercial scale from economical source. Among important compounds derived from or related to nucleic acid are: Adenosine, Adenosine triphosphate (ATP), Adenosin-5-phosphoric acid, Xanthine, and Guanine.

Manufacturer derives nucleic acid from yeast grown in spent sulfite liquor, which was formerly discarded by a paper mill. This material is rich in sugar and now is used to grow Torula yeast, from which nucleic acid can be obtained.

(Nucleic acid is a product of Schwarz Laboratories, Inc., Dept. CP, 230 Washington St., Mount Vernon, N. Y. . . . or for more information check CP 4979 on handy form opposite last page.)

For more information on product at left, specify CP 4980 . . . see information request blank opposite last page.

NOW

Vinyl Acetate

COPOLYMERS

in solution

Made to YOUR Order

for—

- **Adhesive Formulations**
- **Heat-Seal Coatings**
- **Solvent-Reactivating Coatings**
- **Greaseproof Coatings**
- **Laminations**
- **Gloss Coatings for Paper**
- **High Solids Lacquers**
- **Protective Coatings Requiring Good Adhesion**
- **Aerosol Formulations**

YOU CAN GET vinyl acetate *copolymers* in solution—*custom-made* to meet your own requirements. National has developed processes that yield copolymers whose intrinsic differences in chemical structure from that of polyvinyl acetate give them certain unique properties.

Solutions of these copolymers give improved adhesion to a wide variety of difficult surfaces. They can be supplied—

- **In a wide range of molecular weights**
- **In various solvents**
- **In concentrations ranging from low to unusually high solids content**
- **With increased or decreased flexibility or residual tack**

The uses mentioned above are just a few of the many potential applications for these versatile materials. If any of these uses suggests an answer to one of your problems, we'll be glad to work with you in developing the right base and the right formulation to do your job.

For years we've polymerized vinyl acetate in solution form, perfecting our manufacturing processes to "tailor" these solutions exactly to our own needs in adhesive formulations. We have recently expanded our capacity, so that now the technical background and quality control know-how that this experience has given us is available to you. For further information or technical assistance, mail in the coupon.

RESIN DIVISION

National STARCH PRODUCTS INC.

☑ **YES**—We are interested in Vinyl Acetate Polymers and Copolymers in solution for _____ (application).

Please have one of your representatives call on us.

RESIN DIVISION, National Starch Products Inc.
270 Madison Avenue, New York 16, N. Y.

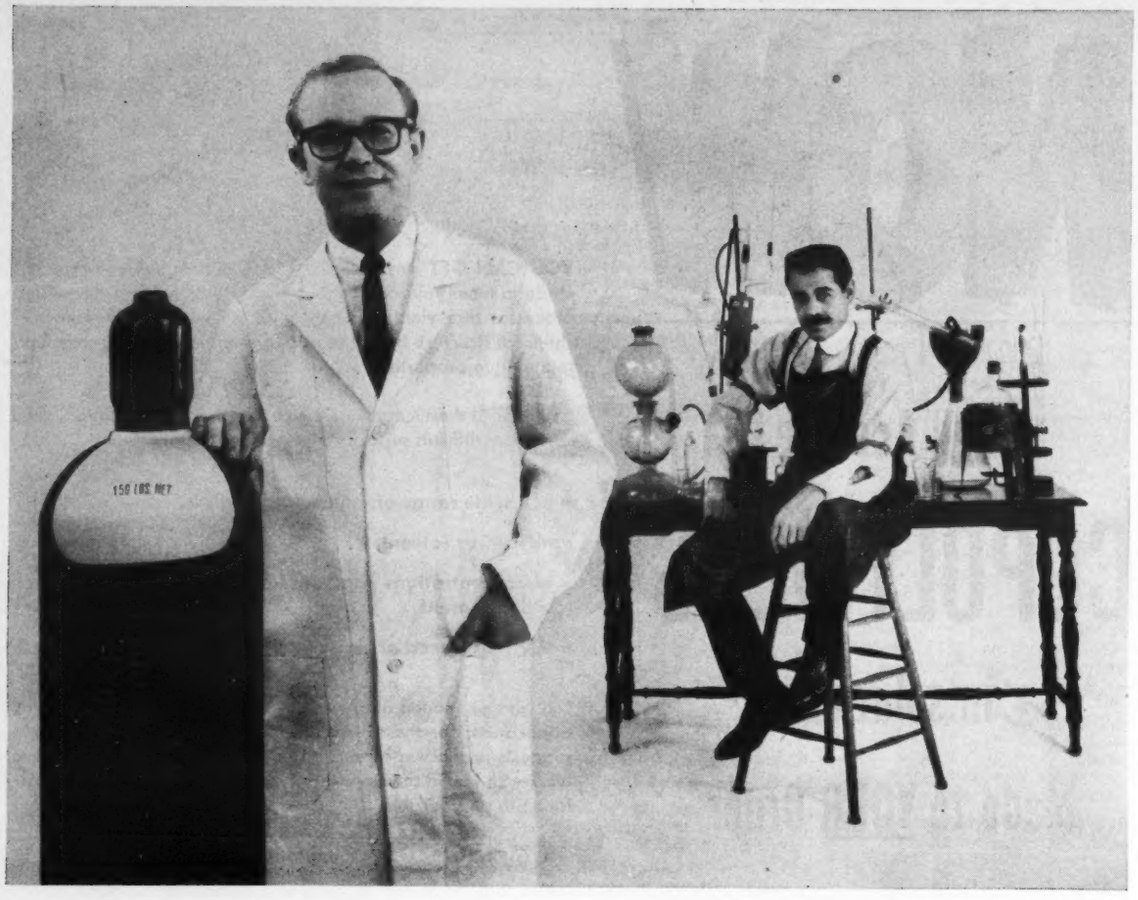
Name_____ Title_____

Company_____

Address_____

City_____ Zone_____ State_____

When inquiring check CP 4981 opposite last page



We can apply 40 years experience to help solve your Sulfur Dioxide problem

The chemist in the background (above) dates us—August of 1915 to be exact. This was the month and year we shipped our first cylinder of liquid sulfur dioxide.

A good deal of our energies during the past 40 years have been devoted to perfecting a quality-control system for the manufacture of sulfur dioxide. Today, we are supplying our customers a near 100 percent pure grade (99.9%) of this chemical.

Equally important, to our way of thinking (our customers' too), has been the growth of our service facilities. Over the years we have been privileged to serve and instruct a host of industries in the economical application of sulfur dioxide. This background of diversified experience is available for your use.

Special problems involving sulfur dioxide, those relating to new or unusual uses, receive special attention in our research laboratories. So if your chemical process includes bleaching, acidifying, purifying, fumigating, reducing, or preserving, investigate the advantages of using Ansul liquid sulfur dioxide. Write ANSUL CHEMICAL COMPANY, Dept. C-34 Industrial Chemicals Division, Marinette, Wisconsin.

ANSUL

When inquiring check CP 4982 opposite last page

Draws preliminary conclusions from outdoor exposure tests of paints made of polymer

A series of outdoor exposures of paints made with Rhoplex AC-33, a water emulsion of an acrylic polymer, have been underway for about two years. Paints were exposed at various locations including Eastern Pennsylvania, Long Island, Delaware, Florida, California, and Arizona. Preliminary conclusions drawn from the tests include:

1—Types and amounts of pigment used with Rhoplex AC-33 affect chalking rate.

2—Best all around results are being obtained at 30-40% pigment volume content level.

3—Type and amount of TiO_2 used has an important effect. Optimum quantity at present appears to be about $2\frac{1}{2}$-$2\frac{3}{4}$ lb/gal of paint.

4—Thus far, type of extender does not appear to have too much effect on film durability.

5—Mildewicide should be added to all formulations. ZnO in system reduces mildew.

6—Loaded zinc oxide gives less chalking than ZnO, but place for lead and zinc pigments has not clearly been defined.

7—Wood staining may occur on application with redwood and cedar siding.

8—Paints are quite permeable to moisture vapor and show very high resistance to blistering in blister box tests.

9—Color retention and whiteness are excellent. Type of TiO_2 has considerable effect on color retention.

(Rhoplex AC-33, used in these test coating formulations, is a product of The Resinous Products Div., Rohm & Haas Co., Dept. CP, Washington Square, Philadelphia 5, Pa. . . . or for more information check CP 4983 opposite last page.)

Eliminates buffing and sanding in making of press-molded or reinforced plastic . . .

plastic finish hides fibrous glass strands and spreads color pigments evenly

Manufacturing procedure worked out by Lunn Laminates, Inc., eliminates buffing, sanding and painting on press-molded or reinforced plastics. Color pigments, impregnated in operation, are spread evenly throughout finished product. Process imparts smooth, glossy metallic-like finish, hiding fibrous glass strands and mat prints.

(Lunn Finish No 107 is a development of Lunn Laminates, Inc., Dept. CP, Huntington Station, Long Island, N.Y. Check CP 4984 opposite last page.)

Average size of MoS_2 powder is less than one micron

Uses: As ingredient in lubricant formulations.

Features: Average particle size is less than one micron. This gives compound superior lubricating qualities and surface-covering ability.

Description: Molykote-Microsize is an extremely fine, pure molybdenum disulfide powder. Particle size distribution, determined by sedimentation methods, is approximately as follows:

Below ½ micron (%, by weight)	43
Below 1 micron	63
Below 3 microns	96
Below 7 microns	100

(Micron-size molybdenum disulfide powder is a product of The Alpha Corp., Dept. CP, 65 Harvard Ave., Stamford, Conn. . . . or for more information check CP 4985 on handy form opposite last page.)

Provides protection against scorch in natural and synthetic rubbers containing SAF blacks

Uses: For preventing scorch in both natural and synthetic rubbers containing super abrasion carbon blacks.

Features: Preliminary work with rubbers containing SAF indicate that 0.5 part of retarder provides adequate protection against scorch. Higher concentrations impart even greater scorch resistance if extreme processing conditions demand additional safety.

Description: Retarder TCM-25 consists of 25% trichloromelamine and 75% blanc fixe. It is nontoxic and non-flammable. Retarding efficiency is maintained at mixing temperatures up to 285°F.

(Scorch retarder is a product of Binney & Smith Inc., Dept. CP, 380 Madison Ave., New York 17, N.Y. . . . or check CP 4986 on handy form opposite last page.)

Three C^{14}-tagged amino acids for metabolism studies

DL-Norleucine (2-C^{14}), DL-norvaline (1-C^{14}), and DL-norvaline (2-C^{14}) are available in one millicurie standard packages. The latter two compounds, differing in C^{14}-tag position, are expected to be of particular use in studies involving mechanisms of amino-acid metabolism.

(Tagged amino acids are a product of Bio-Rad Laboratories, Dept. CP, 800 Delaware St., Berkeley 9, Calif. . . . or check CP 4987 on handy form opposite last page.)

For prompt delivery . . . specify

$H_2N-\overset{\overset{O}{\|}}{C}-NH_2$

DU PONT Crystal Urea

(CARBAMIDE)

Dependably pure and uniform chemical with these rigid specifications:

- pH (10% solution at 20°C.) . . . . . 7.0 to 9.8
- Water . . . . . 0.50% Max.
- Ash . . . . . 35 p.p.m. Max.
- Iron . . . . . 2 p.p.m. Max.
- Free Ammonia . . . . . 20 p.p.m. Max.
- Color, A.P.H.A. (10g. in 100 ml. methanol) . . . . . 10 Max.
- Turbidity, A.P.H.A. (50g. in 100 ml. water) . . . . . 20 p.p.m. Max.

How industry uses this versatile chemical:

The purity and uniformity of Du Pont Crystal Urea make it ideal for use in a large number of products and processes. Listed below are some of the many fields in which it is being used today.

ADHESIVES: Manufacture of urea-formaldehyde resin adhesives, including plywood and paper adhesives, binder for composition board made of wood waste, cold-set glues, laminating resins, and core binders . . . solubilizer in casein, animal and starch glues.

FINISHES: In enamels and other finishes in the form of modified urea-formaldehyde resins . . . in fire-resistant paints.

PAPER: In urea-formaldehyde resins for imparting wet strength to paper and paper coatings . . . softener for glassine paper and similar products . . . ingredient in fire-resistant compositions . . . solubilizer for starch in coatings.

PLASTICS: Manufacture of urea-formaldehyde resin molding compositions.

TEXTILES: In urea-formaldehyde resins to improve crush and crease resistance . . . in acid and direct dyes for screen and roller printing of textiles . . . with starch and other materials for sizing and finishing many types of textiles . . . in flameproofing compositions.

Du Pont Crystal Urea also finds many uses in such fields as cosmetics, detergents and pharmaceuticals.

Du Pont Crystal Urea is packaged in 100-lb. multi-ply paper bags. Prompt shipment can be made from strategically located stock points.

DU PONT

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Polychemicals DEPARTMENT

CHEMICALS • PLASTICS

E. I. du Pont de Nemours & Co. (Inc.)
Polychemicals Dept. 582, Wilmington 98, Del.

Please send me full information on Du Pont Crystal Urea—including specifications, chemical and physical properties, suggested uses, bibliography, etc. I am particularly interested in using Crystal Urea for the following applications: _____

_____

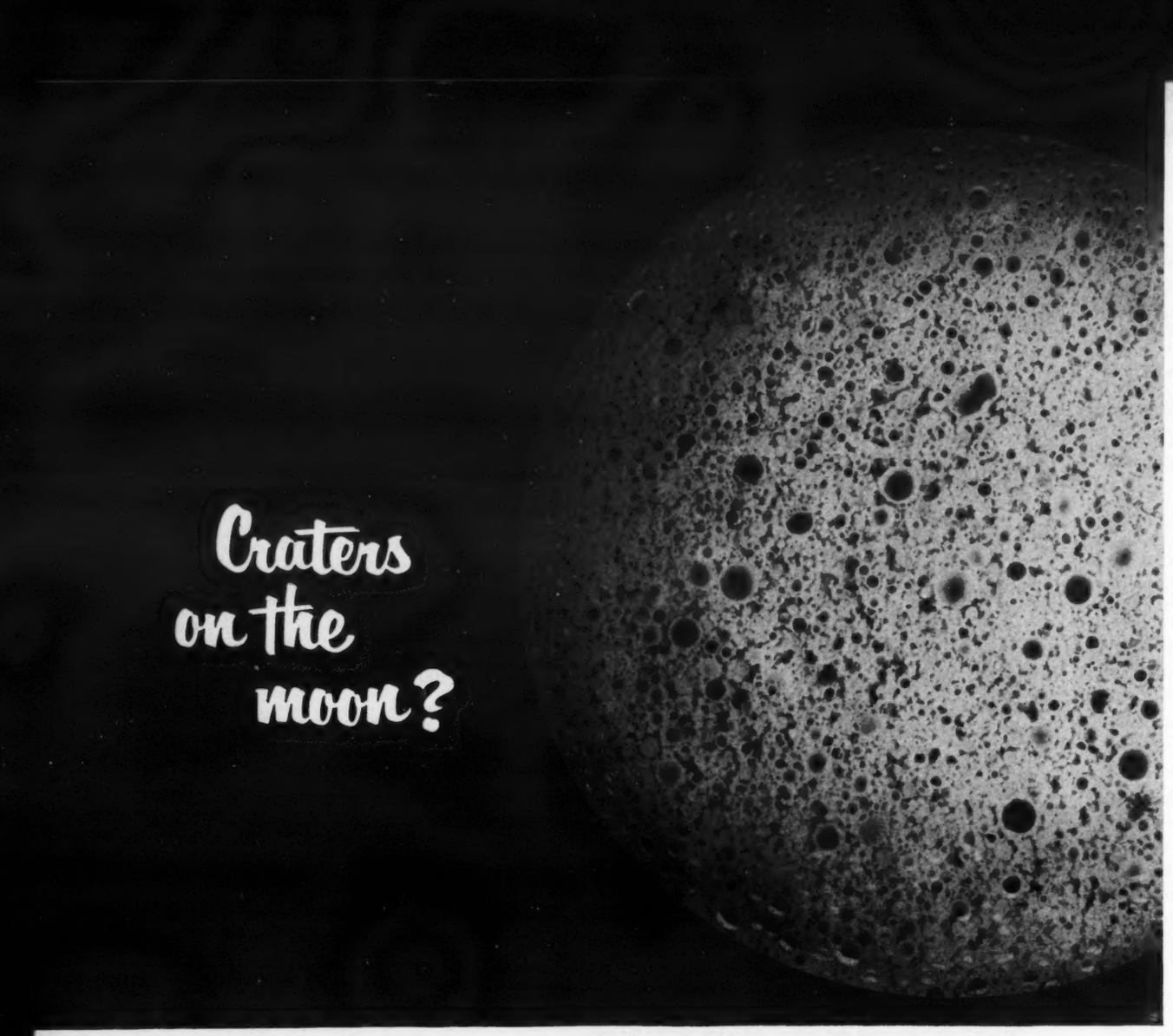
Name _____ *Position* _____

Firm _____

Address _____

City _____ *State* _____

When inquiring check CP 4988 opposite last page



No, they're bubbles made of ALCOA Alumina by The Carborundum Company

Illustrated above is a cross-sectional view of something new in lightweight refractory material, a castable high-temperature cement made from ALCOA Alumina by The Carborundum Company, Perth Amboy, New Jersey. It's one of the world's best insulators in the upper temperature ranges of furnace operations. Mixed with water, the castable containing these pure alumina bubbles can be poured, begins to harden almost immediately thereafter.

Because ALCOA Alumina is so highly refractory, these cements withstand from 2800° to 3100°F depending on the type used. And, because ALCOA Alumina is one of the most stable and inert materials in existence, these cements show little or no shrinkage even at extreme heats . . . are inherently resistant to furnace atmospheres and combustion gases. Further, because of dead air space in the thousands of tiny alumina bubbles, you get an excellent insulator, one that lets a furnace heat up fast.

Carborundum finds that alumina bubbles can be used almost anywhere you need a top-quality refractory with the convenience of a castable. Back-up linings for nonferrous melting furnaces . . . burner blocks for core ovens . . . boiler furnaces . . . malleable annealing furnaces . . . side-wall back-ups. These bonded alumina bubbles are also offered as prefired brick and in special shapes.

If you are looking for *better* refractory performance at higher operating temperatures, look for refractories containing ALCOA Alumina. You'll find they last longer, require fewer tear-downs, are actually most economical.

ALCOA does not make refractories, but we will gladly discuss with you the properties and characteristics of the various ALCOA Aluminas. Write to ALUMINUM COMPANY OF AMERICA, CHEMICALS DIVISION, 705-B Alcoa Building, Pittsburgh 19, Pennsylvania.

ALCOA CHEMICALS

ALUMINUM COMPANY OF AMERICA

Polyvinyl resin pair for calendering, extrusion . . .

medium mw polymers have good heat stability

Uses: A polyvinyl chloride resin formulation designed for calendering, extrusion, and molding.

Features: Excellent heat stability and low gel counts of PVC-111-1 make it ideal for high speed film and sheeting production of such products as shower curtains and inflatable goods.

Formulation PVC-111-4 has short breakup time and excellent powder flow characteristics, heat stability, and low gel counts, making it applicable to wire covering, garden hose, and thin gage film, tubing, and gaskets.

Description: PVC-111-1 is a medium molecular weight homopolymer of vinyl chloride. It may be successfully compounded for extrusion applications wherein fusion is accomplished in Banbury or two-roll mill equipment. PVC-111-4 is a medium mw resin, designed for dry blend extrusion.

(PVC resins are products of Plastics Dept., The Dow Chemical Co., 1000 Main St., Midland, Mich. Check CP 4989 opposite last page.)

Rubber-to-metal adhesive

Data sheet presents applications, advantages, and properties of Thixon CB-2, a rubber-to-metal bonding adhesive. Bul No. 03-7-4-3-54 is issued by Harwick Standard Chemical Co., Dept. CP, 60 S. Seiberling St., Akron 5, Ohio. When inquiring check CP 4990 opposite last page.

For more information on product at left, specify CP 4991 . . . see information request blank opposite last page.

for Coconut Oil
Fatty Acids
and Methyl Esters

rely on
EL DORADO

for PURITY
SERVICE
UNIFORMITY

El Dorado has specialized in coconut oil products for more than half a century. That's one big reason you can depend on the performance of El Dorado products in your formulations. You'll find that El Dorado's standards are the highest in the industry.

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When inquiring check CP 4992 opposite last page

MATERIALS

Tells the story of how and where maker's products are used

Done in easy-to-read style with many pictures and a minimum of technicalities, 36-page booklet tells story of how and where manufacturer's products are used. Photographs and line drawings illustrate the refining and manufacture of high grade petroleum products and derivatives.

"Much More Than Meets the Eye" is issued by L. Sonneborn Sons, Inc., Dept. CP, 300 Fourth Ave., New York 10, N.Y. When inquiring specify CP 4993 on handy form opposite last page.

Combines high surface area, strength and uniformly large pore size with basicity, ionic crystal lattice . . .

magnesia from seawater possesses very high surface activity

Uses: In a wide variety of applications involving catalysts, chromatographic separation, purification, dehumidification, catalyst bases, and extenders of inorganic pigments and dyes.

Features: Adsorbent combines high surface area, uniformly large pore size, and mechanical strength with a high degree of basicity and an ionic crystal lattice.

Description: Sea Sorb is a specially processed seawater magnesia which possesses a very high surface activity. It is available as a powdered material and as a granular product. Physical properties include:

	Sea Sorb 43	Sea Sorb 53
Form	powder	granules
Particle size (mesh)	5% + 200	−20 + 100
Bulk density (lb/cu ft)	35-40	40
Iodine No.	80-90	80-90
Ignition loss (%)	8-12	8-12
Surface area (sq M/gm)	140	140

(Adsorbent and catalyst is a product of Westvaco Mineral Products Div., Food Machinery & Chemical Corp., Dept. CP, 161 E. 42nd St., New York 17, N.Y. . . . check CP 4994 opposite last page.)

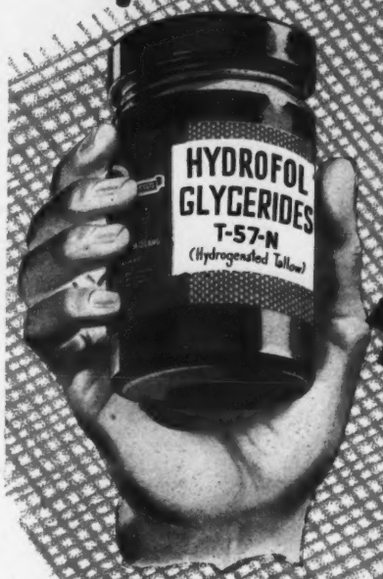
Chemical and rubber industry report

Monthly report from the U.S. Dept. of Commerce will carry statistical and economic analyses of the chemical and rubber industries.

Chemical and Rubber Industry Report is available on yearly subscription of $1.75, payable direct to Superintendent of Documents, Government Printing Office, Washington 25, D.C.

Specify HYDROFOL GLYCERIDES T-57-N

(Hydrogenated Tallow)
for highest quality



TEXTILES

HYDROFOL T-57-N is a superior glyceride with an extremely low free fatty acid content. It is perfectly suited to the manufacture of sizes, finishes, softeners, and other textile chemicals. If you have been searching for a hydrogenated tallow with low iodine value, pure white color . . . a tallow that will not turn rancid . . . write for a sample of HYDROFOL T-57-N today. Excellent, too, for Hot Melt Adhesives and Japan Wax replacements.

SPECIFICATIONS

FFA Max. as Oleic	0.5
Acid Number	1.0 Max.
Saponification Value	193-198
Iodine Value	1.0 Max.
Titre °C	57-61
Melting Pt. °C	59-64
Color Max. (5¼ inch Lovibond)	10Y-1R

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Chemical Products Division • 2191 West 110th St • Cleveland 2, Ohio

When inquiring check CP 4995 opposite last page

Good emulsification properties featured by partially-oxidized polyethylenes . . .

emulsions are clear, stable even at 30-50% solids content

Uses: In polishes, paper and paperboard coatings, and fabric coatings. Presently being evaluated are uses in glass coating, floor emulsions, protection for asbestos-cement house siding, fruit coatings, and coating for glass fiber.

Features: Polyethylene has very good emulsification properties, and can be used by spray or water phase application. Shelf life of emulsions is good, stability excellent. Stable, clear emulsions as high as 30-50% solids can be made. Material in solid state can also be gelled to form firm gel components in oil and wax.

In paraffin wax-polyethylene sizings for paper, properties of scuff and water resistance, and slip appear to be improved. The polyethylene is easy to use and blend, and can be coated below its cloud point.

Description: A-C Polyethylenes 629, 630, and 631 are partially-oxidized polyethylene with an average molecular weight of about 2000. No heavy metals are present, therefore further oxidation is not induced due to their catalytic effect. In the course of the oxidation, breaking of the chain was slight and there is no rancid or objectionable odor associated with the emulsifiable polyethylenes.

Physically, these materials are hard wax-like products having in general, properties intermediate between a vegetable wax such as carnauba and the thermoplastics. Following table gives typical properties:

	A-C Polyethylene 629	630	631
Melting point (°F)	205-208	205-208	205-208
Penetration (100 gm, 5 sec, 77°F)	2-4	1.5-2.5	1.5-2.5
Viscosity (Saybolt furol seconds @ 140°C, 30 cc efflux)	40-50	100-110	80-90
Color	off-white	ivory	slight-green
Sp gr	0.93	0.93	0.93
Acid number	14-17	15-18	16-19
Saponification No.	14-17	15-18	16-19

The following formula has been used in laboratory preparation of water emulsions:

A-C Polyethylene (629, 630, or 631)	40 parts
Oleic aicd	8
Morpholine	8
Water	160

Modifications of the formula are possible. Carnauba or similar waxes can replace the polyethylene over a wide range of concentrations. Ethanolamines

Like nature's porous sponge, Celite has extremely high absorptive capacity. It absorbs 220% of its own weight of water (Gardner-Coleman method)

High absorption

Celite diatomite powders absorb twice their own weight of liquid

Here is a material in powder form, so **porous** that 93% of its volume consists of tiny interconnected pores. This unique structure gives Celite* an exceptionally high absorptive capacity which is now being put to profitable use in a wide variety of industries. For example, Celite serves as a dry carrier for insecticide poisons . . . helps control viscosity in adhesives . . . and makes a highly effective anti-caking agent in fertilizers.

The unique structure of the microscopic Celite particles offers many other advantages. These particles are spiny and irregularly shaped, strong and rigid . . . as a result they do not pack together. Thus Celite powders have great bulk per unit weight . . . making them valuable for fluffing up dry powders such as household cleansers . . . and extending pigments in paint and paper.

Celite's physical structure itself is also utilized in many different ways . . . as the outstanding flatting agent for paints . . . as a mild non-scratching abrasive for fine polishes . . . and to improve surface appearance in plastics. And it is also the reason why Celite can add strength, toughness, stiffness, durability and many other desirable characteristics to your product.

If you want improved product performance or lower production costs, investigate industry's most versatile mineral filler. One of the J-M Celite Engineers will gladly discuss your problem. These men are backed by complete technical services and the Johns-Manville Research Center, largest laboratory of its kind in the world. For further information write Johns-Manville, Box 60, New York 16, N. Y. In Canada, 199 Bay St., Toronto 1, Ont.

*Celite is Johns-Manville's registered Trade Mark for its diatomaceous silica products.

JM PRODUCTS **Johns-Manville CELITE** INDUSTRY'S MOST VERSATILE MINERAL FILLER

When inquiring check CP 4996 opposite last page

may be used, but dry film surface is less water-resistant. Partial replacement of oleic acid with stearic acid or coconut oil gives a more solid-appearing emulsion.

(Emulsifiable polyethylenes are products of Semet-Solvay Petrochemical Div., Allied Chemical & Dye Corp., Dept. CP, 40 Rector St., New York 6, N.Y. . . . or check CP 4997 opposite last page.)

After heating at 500°F for 8 days, resin-glass laminates resist force of 30,200 psi . . .

synergistic action of compounds seen as key

A resin-glass laminate that can withstand a temperature of 500°F for eight days was described. Potential applications include hot gas ducts and high temperature molds and dies.

A resin mixture of maleic alkyd and triallyl cyanurate TAC produced a plastic that withstood a bending force of 19,000 psi after it had been heated at 500°F for eight days. Laminate made from this mixture plus diallyl bicyclo (2,2,1)hept-5-ene-2,3-dicarboxylate (DET) resisted a force of 30,200 psi under the same conditions.

When only DET was added to the maleic alkyd resin, laminate strength after heat treatment was 10,200 psi. This value was below that obtained with the resin and TAC alone, showing the synergistic action of DET and TAC. Moreover, new material will cost less than the TAC plastic.

Addition of DET to resin mixture of TAC and alkyd also increased craze resistance. This effect was least evident when a resin mixture of one part of TAC and one of DET were added to two parts of alkyd. Remarkable heat resistance was ascribed to the thermostability of the *s*-triaxine nucleus and the high degree of cross-linking with the trifunctional monomer.

(Digested from technical paper by Wm. Cummings and Marvin Botwick, Naugatuck Chemical Div., U.S. Rubber Co., Naugatuck, Conn., before Div. of Industrial & Engineering Chemistry at the 126 National ACS meeting, Sept. 1954.)

Reviews properties of molybdic oxide

First in a series devoted to reviewing molybdenum chemistry, four-page bulletin discusses physical and chemical properties of molybdic oxide in detail.

Bul Cdb-1 is available from Climax Molybdenum Co., Dept. CP, 500 Fifth Ave., New York 36, N.Y. Specify CP 4998 opposite last page.

Greatest Advance Since Rubber-Base Paints

NO-DRIP NO-SPILL NO-SETTLE NO-STIR GEL PAINT

—Made Possible by General Mills Polyamide Resins

It's not a liquid—not a solid. The paint above is a new gel paint made thixotropic through Burnok* alkyd vehicles produced with General Mills' Polyamide Resins. This paint won't splatter up a house . . . drip down onto your hand . . . or settle during storage. It needs no drop cloths or stirring sticks.

Polyamide Resins help suspend pigment and vehicle in a jelly-like state indefinitely. There's no time-consuming stirring or straining. Friction of paint brush or roller turns the gel to a flowing liquid. This sets quickly, without sagging or beading.

Could you sell a product like that? One that makes the job easier, cleaner and faster? The zooming sales of T. F. Washburn Company's new thixotropic Burnok* vehicles say you could.

Gel paints are the newest examples in a long and remarkable list of Polyamide Resin applications. Have you a product that needs improved competitive performance? It might reward you many ways to investigate the unique characteristics of General Mills Polyamide Resins. They contribute greater impermeability, better adhesion, improved wearing qualities to a wide range of coating and covering; adhesive and laminating; and potting and casting products.

General Mills also makes a full line of Fatty Nitrogen Compounds and Fatty Acids.

SEND THIS COUPON

*Please note: BURNOK paint vehicles are patented products of the T. F. Washburn Co., Chicago, Ill. and are not offered for sale by General Mills.

PROGRESS THRU RESEARCH

General Mills CHEMICAL DIVISION
Kankakee, Illinois

Please send me technical information on Polyamide Resins to be used for protective coatings or for_____

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Firm_____

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City_____ Zone____ State_____

P 2-55

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Specify: WATSON-STILLMAN

- COUPLINGS
- REDUCERS
- HALF COUPLINGS

And be 3 Ways SURE

...THAT THE MATERIAL IS RIGHT—all W-S steel couplings and reducers are in accordance with ASTM Specification A-105—Grade 2.

...THAT THE MACHINING IS RIGHT—threads or sockets are accurately machined—perfectly aligned.

...THAT THE IDENTIFICATION IS RIGHT—recessed figures on outside circumference clearly define the pressure rating and the material — and the unmistakable Double-Diamond trade mark is your assurance of high quality manufacture.

Watson-Stillman Couplings and Reducers in your piping system mean true economy. They give you long, trouble-free service, insure strong, leakproof joints and readily withstand the effects of shock and vibration.

Strengthen your piping system with these Watson-Stillman fittings. Screw-End Type available in 3,000 and 6,000 lb. class, sizes ⅛" to 6". Socket-Welding Fittings for schedule 40, 80, 160 and Double-Extra Heavy pipe in sizes ⅛" to 6".

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WATSON-STILLMAN FITTINGS DIVISION

H. K. PORTER COMPANY, INC.

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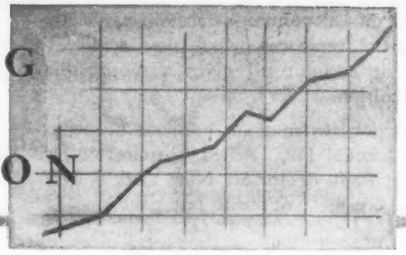
EXPANDING CHEMICAL PRODUCTION



Reichhold to produce penta for wood industries

A pilot plant for the production of penta (pentachlorophenol) by a new process, has been established in Seattle by Reichhold Chemicals, Inc. Company, new in the field of wood preservatives, will serve the lumber industries of the Northwest.

Plant now produces 30,000 lb of penta a month, and will soon be supplemented by a full-size production unit expected to turn out 2,000,000 lb annually at first, 6,000,000 lb eventually.

Company will produce a technical grade of penta and also sodium pentachlorophenate. Other chlorinated organic compounds, including monochlorobenzene, will be available when the Seattle plant is completed.

The new process, which Reichhold is patenting, is based on process for production of halogenated organic chemicals.

Added unit ups carbon black total to 20,000,000 lb/yr

Carbon black production at Columbian Carbon Company's North Bend, La. plant has increased to 20 million lb annually with the addition of the first of three new units.

Processes for making the carbon black were developed by company's research staff. Collection system incorporates silicone-treated glass-fiber bags, boasts essentially 100% collection efficiency.

Carbon black is collected as a fluffy powder, converted to relatively dense, dust-free beads for simple handling.

Construction on the other two units is expected to be completed late this year, bringing production to an estimated 60 million pounds.

Synthetic mica plant for New Jersey

World's first synthetic mica plant is scheduled to begin production early this year at Caldwell, New Jersey. Estimated annual output of new plant will be 1000 tons of high-grade synthetic mica, about 5 to 10% of the nation's current requirement. Plant is being built without government assistance by Synthetic Mica Corporation, subsidiary of Mycalex Corporation of America.

Process to produce sulfur from surface ores

A series of sulfur refineries throughout the world will be engineered and constructed by Southwestern Engineering Company.

Using a new refining process licensed to American Sulfur and Refining Co. by Standard Oil Development, the plants will produce elemental sulfur from low-grade surface ores. Development from surface ores has been uneconomical, but new process may eventually tap more than 60 million tons of sulfur reserves.

SWECO's first plant, in central Utah, is nearly complete.

Hooker making 73% caustic at Montague

Hooker's new Montague, Mich. plant — which began production of caustic soda, chlorine and hydrogen early last year — has added evaporators to produce 73% caustic soda, in addition to the 50% caustic already being produced.

Dock facilities and a 1½ million gal caustic storage tank have been added.

News about chemical materials in the US –
plant construction, increased production . . .
on stream now or planned for future

Hercules plans to process crude tall oil

Hercules Powder Company, maker of more than 800 chemical products, plans to enter a new field — the processing of crude tall oil — early next year.

Company has options on an 80-acre site for the new plant in Southhampton County, Va. Plant is expected to cost several million dollars, will employ around 50 persons, and will have an approximate capacity of 35,000 tons annually.

Kraft pulp mills in the Franklin, Va. area will supply Hercules with the crude oil, through contracts now being negotiated. Resins from the tall oil are used in papermaking, varnishes, printing inks, and as chemical intermediates. Fatty acids are used in soaps, textiles, lubricants, rubber, and paint.

Westvaco Chlor-Alkali plans NH_3 plant

Westvaco Chlor-Alkali Division, Food Machinery and Chemical Corp., is planning a new 60-ton/day anhydrous ammonia plant at S. Charleston, W. Va.

The Lummus Company has contracted to do the engineering and construction work, which is already underway and is expected to be completed late this year.

Sorbic acid unit started by Carbide and Carbon

Construction is underway at S. Charleston, W. Va., on a new sorbic acid unit for Carbide and Carbon Chemicals Co., a UCC division.

Unit is designed to meet increasing demands for sorbic acid as a mold inhibitor in foods. Completion date for unit is this Spring.

Production of ethanolamines begun at new Allied plant

New ethanolamines plant for the Nitrogen Division, Allied Chemical & Dye Corp., under construction since last July, has been completed and production begun.

The Orange, Texas, plant will produce mono-, di-, and triethanolamines by reacting ethylene oxide with ammonia. Basic product of the Orange plant is ethylene oxide; ammonia is shipped in.

Sodium hexametaphosphate plant opens in West

First West Coast plant for the production of sodium hexametaphosphate has been completed by Westvaco Mineral Products Division, Food Machinery and Chemical Corp. Plant, located at Newark, Calif., has a capacity of more than 12 million lb/year.

Crown Central's houdriformer on-stream — 5000 bbl/day

A 5000 bbl/day houdriformer went on-stream recently at the Crown Central Petroleum Corp. refinery near Houston, Texas. The houdriformer (Houdry Process Corp., Philadelphia) is designed primarily for upgrading naphthas for high-octane motor gasoline, but it is also capable of producing aromatics and aviation blending stocks.

American-Marietta acquires Standard Lime & Stone

American-Marietta, manufacturer of building and highway construction materials and concrete pipe, expanded its interests recently, acquiring the Standard Lime and Stone Co., of Baltimore, Md.

NEW CHEMPRO SEAL
INSTALLED IN ONLY 30 MINUTES

NO SPECIAL HOLDING CLAMPS

NO MACHINING OF STUFFING BOX FACES

The new Chempro mechanical seal can be installed in only 20-30 minutes—it requires no special holding clamps or machining of stuffing box faces. It is completely interchangeable with stuffing box packing.

Chempro seals give highly economical service on pumps handling acids, caustics, solvents and other chemical liquids and slurries under a wide range of operating conditions. It has been successfully used under slurry conditions that previously could not be sealed by a mechanical seal.

The seal faces rotate within the confines of the stuffing box, eliminating the hazard of dangerous sprays in handling corrosive, toxic, explosive and flammable materials.

OTHER ADVANTAGES

Simplicity of Design—Only 8 pieces, involving no complicated parts • External Seal—adjustable after installation • Chempro Teflon* Packing—Chemically inert • Eliminates Shaft Scoring • Low Power Costs—Minimum friction load on shaft • Custom Built—To meet particular operating conditions.

For complete details write for new Bulletin CP551.

*du Pont's trademark for its tetrafluorethylene resin

CHEMICAL & POWER PRODUCTS, INC.
The Original Fabricators of Teflon Packings and Gaskets
9 Broadway, New York 4, N.Y.

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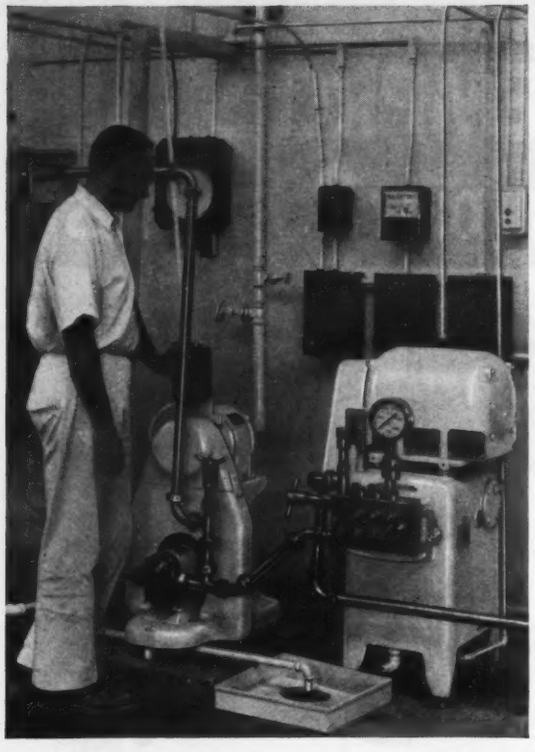

How he makes product improvement a push-button operation!

When he presses the starter button he *knows* he's going to get the smooth consistency in his cosmetic cream that Lady Esther—and his customers—demand.

He knows because the shearing action of this Cherry-Burrell "Superhomo" homogenizing valve absolutely guarantees well dispersed, thoroughly mixed oil globules . . . and eliminates any chance of oil separation back into particles of unequal size and dispersion.

He knows he has the homogenizer he needs because of on-the-job results . . . and because he has seen an independent research study, "Operating Characteristics of Some Commercially Available Homogenizing Valves," that proves conclusively that Cherry-Burrell's "Superhomo" has never been equaled.

If homogenization is one of your problems, you should see a copy of this impartial research report. Ask your Cherry-Burrell Representative to show it to you.

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Equipment and Supplies for Industrial and Food Processing
FACTORIES, WAREHOUSES, BRANCHES, OFFICES OR DISTRIBUTORS AT YOUR SERVICE IN 56 CITIES

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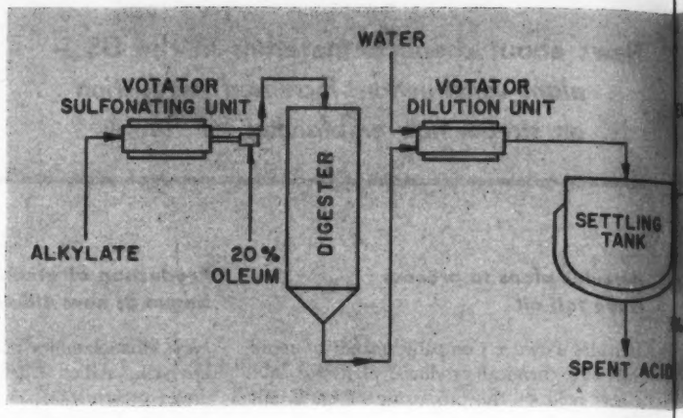
ideas — from other industries and the AEC . . . new trends in research, processes, services



Here's a method for making synthetic detergent from alkyl benzene and oleum by —

continuous sulfonation

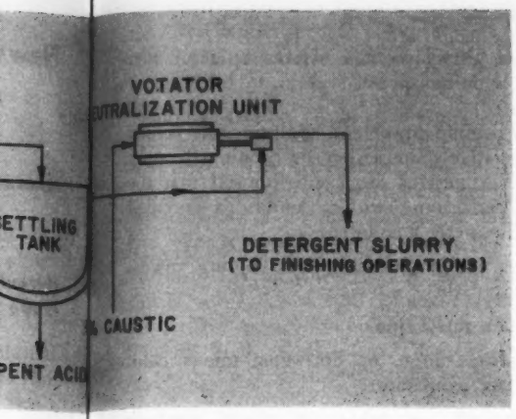
Process assures high yields, has economic and quality advantages over conventional batch methods

Using scraped-surface heat exchanger-reactors in its major steps, continuous sulfonation process produces uniform high-active synthetic detergent slurry from alkyl benzene and oleum. Slurry contains 48 to 52 per cent water, which can be removed later. On dry basis, product contains 86 to 88 per cent sodium sulfonates, 12 to 14 per cent sodium sulfate, and less than 1 per cent free oil. Good yields are obtained and process is reported to offer substantial economic and quality advantages over conventional batch methods.

Alkylate and 20 per cent oleum are brought together in a multiport injection Votator reactor. Unit consists of jacketed cylinder having an internal rotating shaft provided with scraper blades. Multiple point injection is provided through either shaft or jacket. Violent agitation affords intimate contact of the immiscible materials. Overall heat transfer of unit is high — about 200 Btu/hr/sq

Continuous Sulfonation of Alkyl Benzene with 20% Oleum
Composition of Product Streams

	Feed To Sulfonating Unit	Discharge From Digester Tank	Feed To Dilution Unit	Discharge From Dilution Unit	Overflow From Settling Tank	Spent Acid Discharge	Feed To Neutralizing Unit	Product	Product	
									% Composition As Discharged	% Composition Dry Basis
Alkylate, lb (MW: 232)	350	3.5	3.5	3.5	3.5	----	3.5	3.5	0.3	0.6
Oleum, lb (104.5% H_2SO_4)	437.5	----	----	----	----	----	----	----	----	----
Sulfuric Acid, lb (Y % H_2SO_4)	----	317.6 (97.9%)	317.6 (97.9%)	399.0 (78%)	64.43 (78%)	334.57 (78%)	64.43 (78%)	----	----	----
Sulfonic Acid, lb (RSO_3H)	----	466.4	466.4	466.4	464.07	2.33	464.07	----	----	----
Sodium Sulfonate, lb (RSO_3Na)	----	----	----	----	----	----	----	496.0	45.5	86.7
Caustic Sol., lb (18% NaOH)	----	----	----	----	----	----	558.0	----	----	----
Sodium Sulfate, lb	----	----	----	----	----	----	----	72.8	6.6	12.7
Water	----	----	81.4	----	----	----	----	517.7	47.6	
Total lb/hr	787.5	787.5	868.9	868.9	532.0	336.9	1090.0	1090.0		----



ft/°F (minimum). Temperature is held at 80°F, and reaction is 90% complete in seconds.

Mixture then passes to digester where remaining 10 per cent of reaction is completed — requiring anywhere from 3 or 4 minutes to 1 or 2 hours. Unit consists essentially of an expanded section or tank — having neither agitator or jacket.

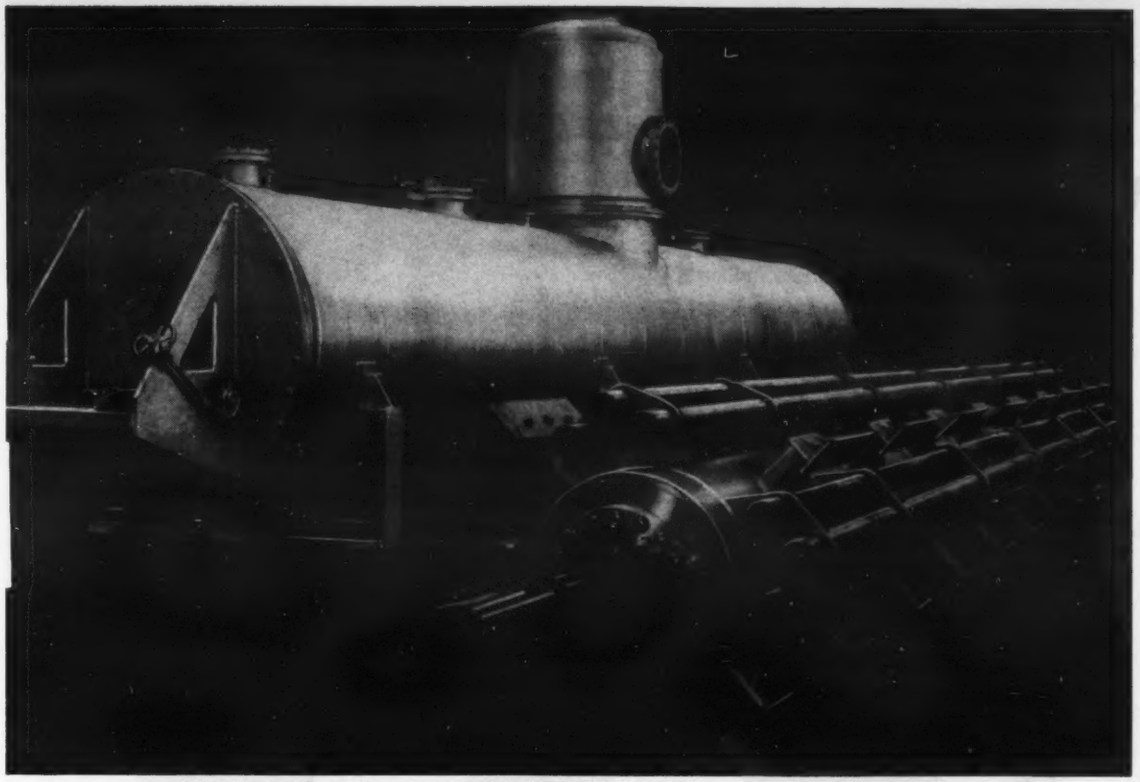
From digester, material goes to Votator reactor similar to one used for sulfonating. Required amount of water is metered through shaft while mixture from digester enters through inlet in head opposite drive. Dilution causes separation between sulfonic acids and excess sulfuric acid.

Material from Votator next passes into large settling tank. Unit is equipped with means for external heating so that optimum conditions can be maintained for rapid separation. Temperature is held at about 130 to 135°F, and maximum holding time is six hours. Spent sulfuric acid is withdrawn from bottom of tank. Sulfonic acid from top of separation tank is metered with appropriate quantity of 18 per cent sodium hydroxide into another multiple-port injection Votator reactor where neutralization is accomplished. Resulting slurry is sent to compounding step, from which it goes to dryer (spray tower or steam-heated roll).

Total floor area for three million pound per year plant is about 10 x 20 ft. Other size package plants can produce six and 25 million pounds per year. Process also works with 100.5 or 98 per cent acid.

Same equipment may be used for low-active slurry (approximately 25 per cent active ingredients), but in this case, only sulfonation, digestion, and neutralization steps are needed. System can also be used for the sulfation of fatty alcohols. Amines or ammonium hydroxide can be used in neutralization step if such salts are desired.

(Continuous sulfonation process is development of The Girdler Company, a division of National Cylinder Gas Company, Dept. CP, Louisville 1, Kentucky . . . check CP 5003 opposite last page.)



Buflovak Vacuum Rotary Dryer—with revolving heating tubes and heated agitator arms shown separately

Buflovak Vacuum Rotary Dryers provide low temperature drying with agitation . . . and recovery of solvents

When you need a vacuum rotary dryer, you may readily find that a *Buflovak* conventional type is just right for your production requirements.

Built in a wide range of sizes, this dryer consists of a jacketed cylinder, heated by steam or hot water—charge and discharge openings—and a revolving agitator that accelerates both the drying and the discharging of the dry material. Mounted on the agitator shaft are straight or helical-faced blades, which thoroughly mix the material with a shearing action that reduces power consumption. When desired, other features may be furnished to give these standard *Buflovak* Vacuum Rotary Dryers a wide range of applications.

If your needs require special equipment, our engineers have the practical experience and technical know-how to design and build dryers for any special application. One example is special agitators for breaking up materials that form lumps, thereby reducing them to a uniform powder during drying operation.

In addition, you have the advantages of the complete facilities of the *Buflovak* Research and Testing Laboratory. This includes a pilot test plant which is used for pre-testing both processes and products. It's your assurance that the equipment you buy will meet your requirements.

These services are readily available to help you solve your drying problems.

Write for Catalog 341 to get complete information about Buflovak *Rotary Dryers.*

BUFLOVAK EQUIPMENT DIVISION
BLAW-KNOX COMPANY
1645 Fillmore Avenue, Buffalo 11, New York

BLAW-KNOX

BUFLOVAK PRODUCTS: evaporators • dryers (atmospheric and vacuum) • solvent recovery and distillation equipment • chemical plant equipment • food processing equipment • kettles • fabricated processing equipment • vulcanizers . . . plus a complete Pilot Plant for pre-testing processes and products.

When inquiring check CP 5004 opposite last page

Switch to disposable NEW KIMWIPES and get 4-10 times more wiper area per dollar!

Don't let expensive cloth and waste wipers rob you of profits. Replace them with Type 1300 Kimwipes — the modern industrial wipers that are so soft, strong, absorbent and economical, they make ordinary wipers obsolete! A full 12" x 18" in size, Kimwipes 1300 hold up to eight times their own weight in liquids.

They're non-abrasive, too. There's no holdover of metal chips or other infectious material that may cause dermatitis (an infection that cost industry a loss of 2,500,000 man hours and a financial loss of nearly two million dollars last year). Type 1300 Kimwipes are absolutely clean to start with and are disposed of after use. Ask your salesman for a sample. And remember, you can also buy Type 900-S Kimwipes (optical wipers) and Type 900-L Kimwipes (precision wipers). Save money. Order today!

Kimberly-Clark Corporation • Neenah, Wisconsin

When inquiring check CP 5005 opposite last page

Testing cooling towers — do it yourself . . .

simple, direct method assures operator that unit is doing specified job

Testing a cooling tower and analyzing the results can be a relatively simple job. By running the tests himself, the operator can assure himself that the tower is performing within conditions specified by manufacturer's guarantee.

Guarantees for mechanical draft cooling towers usually cover the following:

1) Water rate, gpm.
2) Cooling range, or hot-water minus cold-water temperature.
3) Approach, or cold-water minus wet-bulb temperature.
4) Wet-bulb temperature.
5) Contract horsepower to fans.

Additional specifications may include drift loss (usually 0.2% of water rate), sound level 50 feet from base of tower, pumping head, and maximum or minimum wind velocity and direction. It is seldom possible to duplicate conditions specified in the guarantee during a test, so the operator must compare the test conditions with those specified in the guarantee.

Water Rate If flow meter has not been provided with tower, pitot tubes may be inserted through a stuffing box and connections made inside a straight run of pipe. Measurements are made by traversing the pipe to obtain readings with a U-gage attached to pitot tube.

Other methods for measuring flow can be used too. Flow may be diverted into a container of known size and the rate determined by timing. Or, weirs may be installed to measure flow in a conduit to or from the tower. Some towers serve equipment having a known or measurable heat load. In this case, flow may be calculated from heat load and cooling range. Use of a pump curve is convenient too, but accuracy is limited, unless it is based on an actual test of the pump. It is always advantageous to measure flow by more than one method as a check.

Water Temperature It is usually best to use mercury-in-glass thermometers in direct contact with the water to measure temperatures to and from tower. Temperatures must reflect true average temperatures. Particular care must be taken to select location where stream has been thoroughly mixed and become uniform. Discharge of pump, if adjacent to tower, is usually satisfactory.

Wet-Bulb Temperature Wick of sling psychrometer must be clean and instrument whirled fast enough to induce air velocity of 1000 fpm across bulb. Guarantees based on entering wet-bulb temperature usually specify test procedure.

Fan Horsepower Contract horsepower refers to output of prime mover—usually an electric motor. Readings should include volts, amperes, and either watts or power factor. Efficiency must be obtained from curve of motor characteristics or assumed.

Pumping Head Total pumping head is total pressure above curb of cold-water basin, less friction loss in riser. It represents pressure due to difference in elevation between basin curb and center line of inlet of distribution system, plus pressure and velocity heads at center line of inlet.

(Information on tower testing summarized from Bul R-54-P-5, issued by Technical Services Department, The Marley Company, Dept. CP, 222 W. Gregory Blvd., Kansas City, Mo. Check CP 5006 on handy form opposite last page.)

Ordinary spray gun applies ceramic coatings to variety of materials . . .

thickness, rate of application easily controlled; coatings resist heat, chemical attack

Heat-resistant, flexible ceramic coatings can be applied to a variety of materials by a simple, inexpensive process. Called "solution ceramics", the coatings are put on with an ordinary spray gun at relatively low temperatures (400-700°F). Coatings can range in thickness from a hundredth to a few millionths of an inch. Thickness and rate of application are easily and accurately controlled.

Coatings can be applied to almost any clean, solid surface. Resistant to chemical attack (even at elevated temperatures), they are soft enough to permit underlying sheet metals to be stamped after coating. Ceramics are so adherent to surface of base material that other coatings can be anchored to them.

Coatings consist of refractory metal oxides. Solutions can be made of zirconia, titania, chromia, ceria, magnesia, or similar materials. Studies indicate that certain phosphates, silicates, fluosilicates, oxyhalides, and even metals, may be deposited by same method.

Potential applications include foundry uses; colorant for pottery and tile; coating method for applying conductive, photo-emissive, catalytic, or decorative coatings to glass, ceramics and cermets (composites of ceramics and metals); and for providing high-temperature coatings to resistor wire or tape, condensers, wire-wound conductors, and thermocouples.

(Process was developed and is being licensed by Armour Research Foundation, Illinois Institute of Technology, Dept. CP, Technology Center, 35 West 33rd Street, Chicago 16, Illinois.)

NO MUD IN YOUR EYE HERE!

Here's how Dracco application engineering ended a serious dust nuisance for a Texas company manufacturing drilling muds.

Used in oil well drilling operations for bit lubrication and hole sealing, drilling muds are produced from specially processed clays. Bagging of these clays created severe dust concentrations at two plants, exposing personnel to unhealthy conditions.

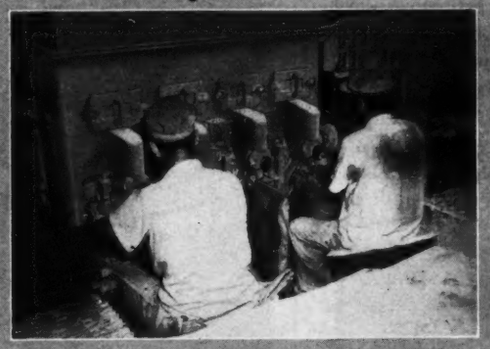
Dracco Multi-Bag Filters provided positive control of these dusts and brought immediate relief by eliminating all "dusty" mud.

Wherever Dracco Filters are put to work, they are constantly protecting plant efficiency . . . safeguarding workers' health . . . cutting housekeeping costs . . . reducing machine wear from abrasive dusts . . . or recovering valuable materials at collection efficiencies of 99½—100%.

If uncontrolled dust is muddying your profit picture, Dracco Filters can provide a proved method for solving your problem.

Men and machines (left photo) can now bag drilling mud materials at top efficiency in dust-free atmosphere.

Dracco Multi-Bag Filter (right photo) now controls nuisance dusts, assuring cleaner working conditions and higher production.



DRACCO CORPORATION
4070 East 116th Street · Cleveland 5, Ohio

DRACCO *Performance Proved*
Airstream CONVEYORS · DUST CONTROL EQUIPMENT

Dracco 40-page Bulletin 800 presents complete technical information on "Industrial Dust Control and Recovery". Write for your copy today.

When inquiring check CP 5007 opposite last page

Book contains four-step course for fighting water pollution

Designed to help sewage treatment experts, municipal officials, and civic leaders, two-color, 34-page bulletin explains importance of proper sewage treatment and tells how to get it. Booklet contains facts on water pollution, a four-step course of community action to fight pollution, examples of successful municipal campaigns, and methods of maintaining public support for such programs.

Bul GEA-6096 is issued by News Bureau, General Electric Company, Dept. CP, One River Road, Schenectady 5, New York. When inquiring specify CP 5008 on handy form opposite last page.

Battery with silvium plates lasts more than 17 years . . .

metal reduces amount of positive grid corrosion

A series of two- and three-cell batteries having silvium alloy (lead, antimony, arsenic, and silver) positive plates in place of conventional lead plates, is being marketed. Units are reported to last more than 17 years. A typical battery outlasted two police prowl cars and finally wore out after 170,875 miles.

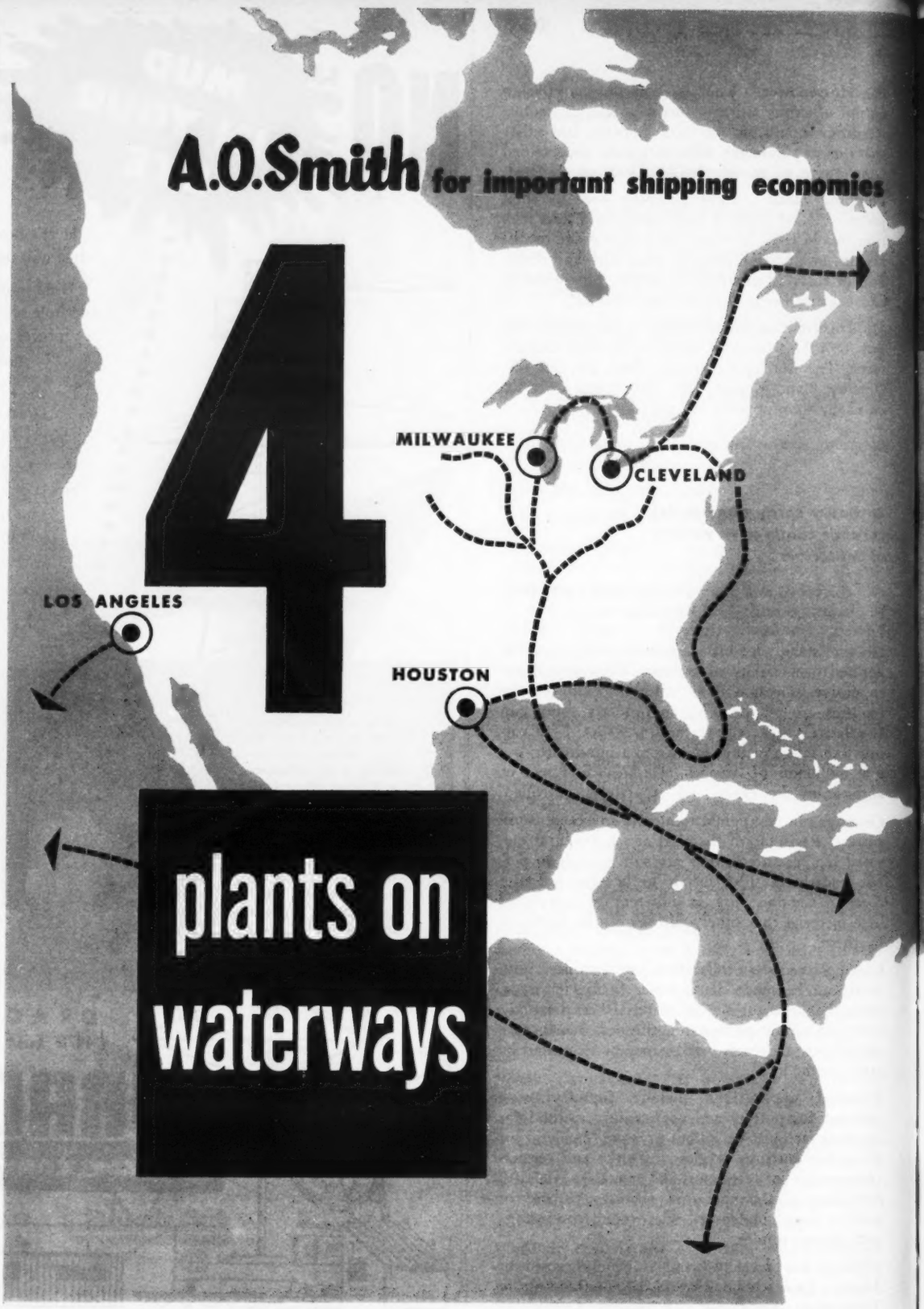
Most important feature of the alloy is that it cuts down positive grid corrosion. Officials state that the corrosion and allied side reactions cause about 60 to 85% of all battery failures.

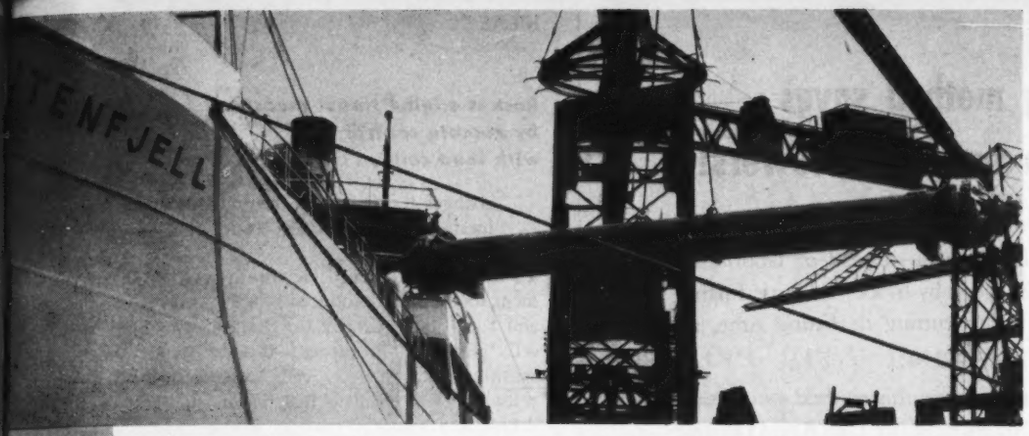
The batteries are in transparent polyethylene plastic cases designed to show at a glance the level of the

Batteries have positive plates constructed of silvium alloy. Similar battery outlasted two police prowl cars

electrolyte. Markings on the case indicate recommended high and low electrolyte levels.

Built into each outer cell is a chamber in which a red, a white, and a blue ball float in electrolyte when battery is fully charged. When battery is 10% discharged the blue ball sinks. At 1/3 discharged the white ball sinks, and when 2/3 discharged the red





92,000-lb. synthesis converter being loaded for shipment at Milwaukee to Norsk Hydro Elecktrisk Kvoelstofaktuselskat at Glomford, Norway. Featuring exclusive MULTI-LAYER construction, the unit is 40-ft. face to face, with 31½ in. ID and 3¾ in. wall thickness. Designed to operate at pressures of 3556 psi.

Save on shipping costs . . . because our Milwaukee, Cleveland, Houston and Los Angeles vessel plants are located on waterways . . . because this provides for direct, economical transportation of large pressure vessels and heat exchangers to domestic and foreign ports. If your operations are near waterways, you can well imagine the advantages inherent in this strategic location of A. O. Smith manufacturing facilities.

Erection problems reduced . . . because waterway shipment permits delivery of fractionators, converters, accumulators, stainless and glass-lined reactors, as well as other larger vessels in one or, at most, two pieces. You can avoid field assembly costs . . . or, at least, reduce them considerably. The overall result is welcome economy in time and money.

Another good reason why it pays to see A. O. Smith first when you contemplate the purchase of pressure vessels and heat exchangers. We'd be glad to tell you about some of the other good reasons why it's good business to deal with A. O. Smith. Your letter to our Milwaukee office will bring a prompt reply.

Through research . . . a better way

A.O.Smith

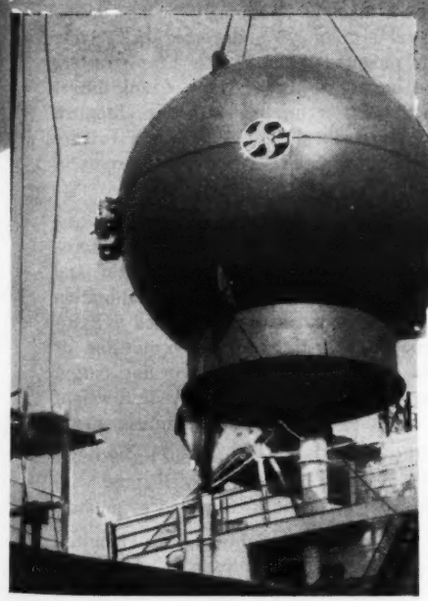
CORPORATION

PROCESS EQUIPMENT DIVISION

MILWAUKEE • HOUSTON • LOS ANGELES

International Division: Milwaukee 1

for glass-lined process equipment, contact GLASCOTE PRODUCTS, INC., Cleveland 17, Ohio an A. O. Smith Subsidiary.



This furfural digester, produced at A. O. Smith's Houston plant, is being loaded aboard a freighter for shipment to the South Porto Rico Sugar Trading Corporation, La Romana, Dominican Republic. Weight is 73,780 lbs. . . . diameter is 20 ft. . . . walls are 1-in. thick.

Weighing 181,200 lbs. each, these giant coking drums are being barge-loaded at Milwaukee for shipment to the Pure Oil Company's installation at Toledo, Ohio. Shipping route is up Lake Michigan, through the Mackinac Straits, along Lake Huron to Lake St. Clair . . . then to Toledo by way of the Detroit River and Lake Erie.

When inquiring check CP 5009 opposite last page

ball goes down. Automatic venting device in each cell prevents excessive gas accumulation.

Length of batteries ranges from 4½ to 11⅜ inches. Width and height have been standardized at 7-5/16 x 10⅜ inches in all four available sizes.

Industrial applications include emergency lighting, switchgear control, fire alarm systems, telephone stand-by, railway signal control, and other stationary power applications requiring stand-by current.

(Batteries are product of The Electric Storage Battery Company, Dept. CP, 42 South 15th Street, Philadelphia 32, Pa. . . . or for more information check CP 5010 on handy form opposite last page.)

Transistor-mag amp circuits key to 'time control' . . .

can make accurate time delays of any length

Although currently only available in watt sizes, transistors are achieving things difficult for engineers to believe. When used in conjunction with magnetic amplifiers they can make a time delay of any length. These are accurate to within 1/60 of a second, if 60-cycle power is used. Same circuit can be used as counter of events, as represented by pulses.

Transistors can make switches or relays, completely static, having indefinite life. Efficiencies of these are over 90% — as compared to the 50% of a conventional class-A electronic amplifier stage.

Transistors are making the old dream of a high-efficiency DC transformer a reality. Used in a relatively simple circuit, transistors convert DC to an AC square wave. This can be changed in voltage and, by full wave rectification, returned to DC. Overall efficiencies for circuits delivering a few watts are about 90%.

(Information courtesy of Westinghouse Electric Corporation, Dept. CP, 401 Liberty Avenue, Box 2278, Pittsburgh 30, Pa.)

Covers ion exchange in plating field

Applications of ion exchange to plating plant problems are described in illustrated eight-page report. Article discusses methods of treatment, use of ion exchange in plating room, relative advantages of batch and continuous treatment, and economic factors of other phases of field.

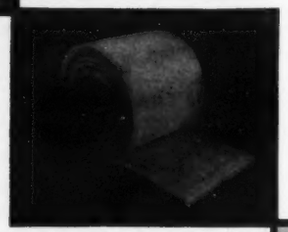
Technical reprint T-123 is issued by Graver Water Conditioning Company, A Division of Graver Tank and Manufacturing Company, Inc., Dept. CP, 216 West 14th Street, New York 11, New York. When inquiring specify CP 5011 on handy form opposite last page.

New insulating method saves hours and hours on tanks and towers!

Imagine wrapping tanks and towers with a lightweight, flexible insulation that fits any curved or flat surface—instead of laboriously building up rigid insulating materials, block by block. Imagine further that the new method requires almost no cutting or fitting time, no expansion joints or welded rings, no pointing up.

Then imagine how much time and money this method would save you—and at once you'll see the advantages of using ULTRALITE long glass fiber insulation blankets. It is easily applied and easily finished with weather-proofing materials. Savings are truly worthwhile, as proved time and again on oil storage tanks, asphalt truck tanks, fractionating columns, reboilers, blending tanks, etc. (And for hot or cold piping, savings are just as substantial when you use our new G-B Snap*On pipe insulation—a one-piece molded pipe insulation of fine glass fibers.)

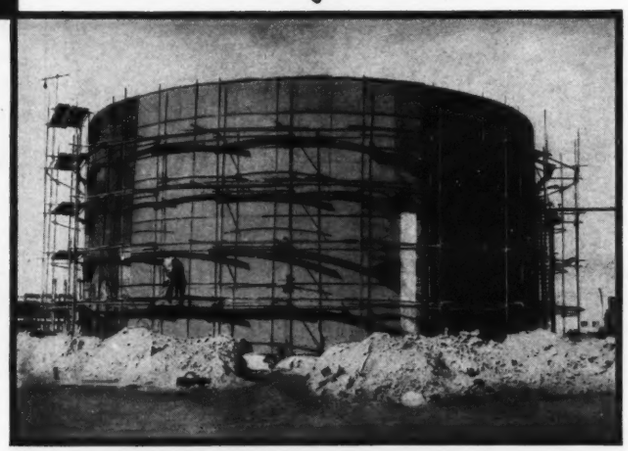
No damage from water . . no heat loss from "fluing action" . . ., no problems when repairs are necessary—for Ultralite is resilient, reusable, won't absorb moisture.



ULTRALITE

the long glass fiber insulation

Write today for
"How-To-Do-It" specifications
and name of your nearest Ultralite distributor



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When inquiring check CP 5012 opposite last page

Rocket engine thrust measured by remote control with load cells . . .

changes transmitted to central instrument room located 400 to 600 feet away

To measure and record electrically, at central instrument room, thrust produced by various rocket engines and fuels, Bell Aircraft Corporation uses SR-4 load cells of 20,000-lb capacity on test stands. Highly sensitive and accurate, cells contain load-sensitive resistance wire elements that respond to variations of thrust, and transmit changes in electrical resistance to recorder 400 to 600 feet away.

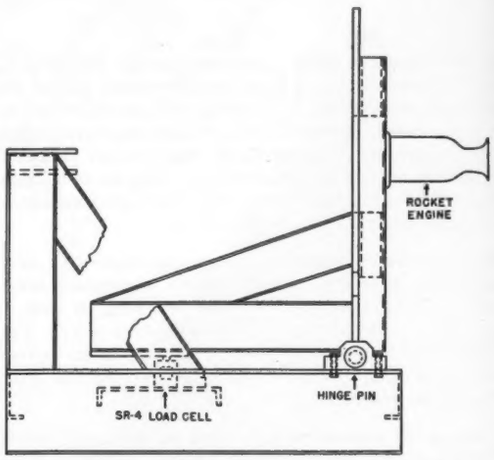


Diagram shows principle of measuring rocket engine thrust

Rocket engine is mounted horizontally on upstanding end of vertical arm of 90° reinforced bell crank. Load cell is mounted vertically on base structure under end of horizontal arm of crank. Crank hinges on pin which holds it on base structure. Moment arms are of about equal length. Weights balance over-hanging engine. Cell is connected to recorder by cable.

To be sure that records obtained from cells are true load reactions of engines (freed of frictional effects, slight variations in the 1:1 moment arm ratio, and other effects produced by test stand), calibration tests are run as horizontal loads are applied to vertical arm through calibrating cell on center-line of engine. Input load is measured by recording output of calibrating cell, which is periodically dead-weight tested, and output is recorded in instrument room.

Differences in readings can be zeroed out on recorder so that direct readings in pounds will agree with calibrating instrument readings converted to pounds.

(Load cells are product of Baldwin-Lima-Hamilton Corporation, Dept. CP, 940 Simpson St., Eddystone 42, Pa. . . . or for additional information check CP 5013 opposite last page.)

Boiler's refractory walls protected by controlling flow of water through door's coils . . .

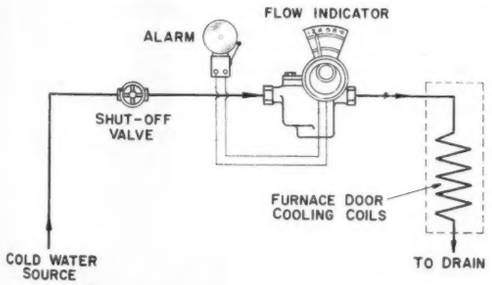
indicator detects flow variations, sounds alarm for quick compensation

Combines electrical signal with visual indication at measurement site

To protect doors in the refractory setting of boiler walls, Associated Gas & Electric Company circulates water through cooling coils in doors at its Ohio Power Company plant at Relief, Ohio. Maintenance of constant flow is required for normal coil temperature.

Company installed Henszey automatic indicating flow meter with mercury alarm switch. By simple manual adjustment, settings are made to indicate high or low flow rates through cooling system. Should flow vary because of pressure variation, diversion, pipe stoppage, or furnace temperature change, alarm circuit is energized. Plant personnel can then make flow adjustment to compensate.

Control system has extended life of refractory materials three to four times normally expected usage. Thermostatic switch control in drain line



Schematic diagram of cooling system

monitors drain temperature and signals if temperature is above or below established limits. This provides safeguard in event of failure at the flow alarm. Alarms from temperature switch have been minimized since flow indicator was installed.

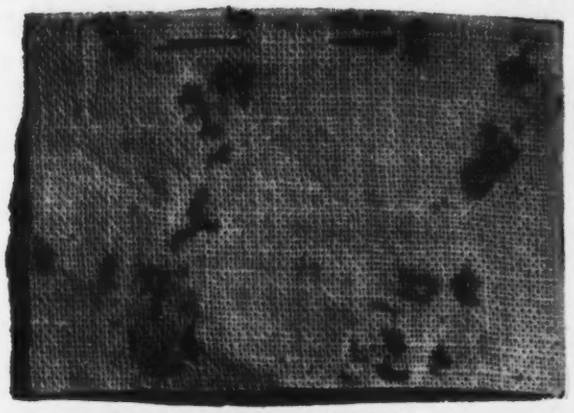
(Henszey flow indicator is a product of Henszey Co., Dept. CP, Watertown, Wisconsin . . . or for more information reader may simply check CP 5014 on handy form opposite last page.)

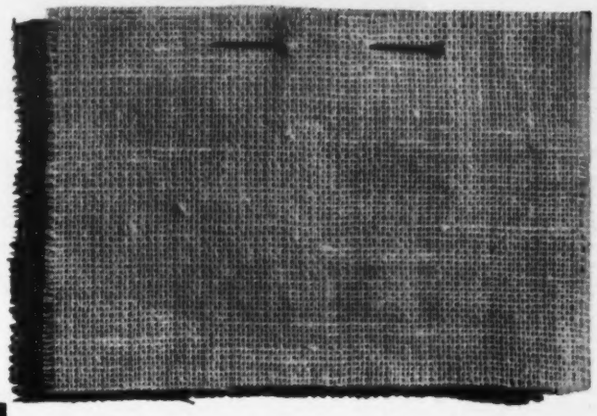
DOW

Dowicide Preservatives

protect grey goods and finished textiles against mildew

Liquid starch size containing Dowicide Preservative guards cloth fibers from discoloration and structure-weakening mold growth





Bolts of grey goods and finished textiles can be stored far longer without suffering costly damage from mold destruction.

DOWICIDE® PRESERVATIVES make the difference so obvious here. These two grey goods samples are identical in all but *one* respect: sample at *top*, above, is sized with *unpreserved* starch; piece *below* is warp-sized with liquid starch containing a Dowicide Preservative. Samples were exposed for equal time to conditions favoring mold growth. Piece with *untreated* size is discolored and weakened—costlier, heavy bleaching is now necessary to remove discoloration. In contrast, sample with *preserved* size has effectively resisted mildew.

In almost *any* business you might name, Dowicide Preservatives of widely varying characteristics increase manufacturing efficiency and hold top product quality. Fourteen different Dowicides are used in the leather, paint, petroleum, paper and pulp, adhesives, agricultural, transportation, cordage and other industries. *Your* processing, packaging or selling operations might well benefit through use of one or several of these versatile Dowicide Preservatives.

Dow's laboratories will consult with you regarding your individual preservative problems. For detailed information, mail coupon to THE DOW CHEMICAL COMPANY, Midland, Michigan.

THE DOW CHEMICAL COMPANY
Dept. DP 650C, Midland, Michigan

Please send me further information on the uses of Dowicide Preservatives.

Name_____
Title_____
Company_____
Address_____
City_____ Zone_____ State_____

you can depend on DOW CHEMICALS

DOW

When inquiring check 5015 opposite last page

Sharp & Dohme reports LATTICE BRAID* Teflon† PACKING gives excellent service on glass-lined agitators handling organic solvents

*Registered Trademark. *Only* Garlock makes LATTICE BRAID rod and shaft packings.

The Sharp & Dohme Division of Merck and Co., West Point, Pa., found that braided packings lost their shape while in use and extruded from the bottom of the stuffing boxes on their glass-lined agitators. Furthermore, some of these packings would react with the solvents in the vessels. According to E. P. Street, chemical engineer at Sharp & Dohme, LATTICE BRAID Teflon packing is not affected by the solvents, retains its square shape, and does not extrude. This has meant fewer repacking jobs and, thus, substantial labor savings to Sharp & Dohme.

Put Garlock LATTICE BRAID Packing to work for your company. All the braided strands of this unique packing are lattice linked together into one structural unit. The strands hold together even when the packing is worn far beyond the limits of wear of ordinary braided packings.

LATTICE BRAID is made from flax, cotton, asbestos, wire-inserted asbestos, Teflon, and asbestos with Teflon impregnation—for various types of services.

Get all the facts about LATTICE BRAID *Packings. Contact your Garlock representative or write for new folder AD-131.*

THE GARLOCK PACKING COMPANY, PALMYRA, NEW YORK

Sales Offices and Warehouses: Baltimore • Birmingham • Boston • Buffalo • Chicago • Cincinnati • Cleveland Denver • Detroit • Houston • Los Angeles • New Orleans • New York City • Palmyra (N. Y.) • Philadelphia Pittsburgh • Portland (Oregon) • Salt Lake City • San Francisco • St. Louis • Seattle • Spokane • Tulsa.

In Canada: The Garlock Packing Company of Canada Ltd., Toronto, Ont.

† The Du Pont Company's Trademark

GARLOCK LATTICE BRAID PACKING

When inquiring check CP 5016 opposite last page

IDEAS

Rocket fuel oxidizers handled successfully by plastic hose . . .

H_2O_2, HNO_3 have no ill effects on fluorocarbon product

Highly active hydrogen peroxide and white fuming nitric acid, used in rocket engines, are handled without any deleterious effects by special fluorocarbon hose. Resistant to corrosion and temperature extremes, hose has withstood exhaustive testing for use with fuel oxidizers in all types of rocket engines.

Originally developed to handle newer fuels and synthetic lubricants in jet aircraft operation (CHEMICAL PROCESSING, May 1954, page 43), the hose is flexible and weighs about half as much as conventional hose previously used for similar applications.

Hose is available in diameters from ¼ to 1 inch. It is suitable for tank-to-tank transfer of the oxidizers.

(R-500 fluorocarbon hose is product of Resistoflex Corporation, Dept. CP, Belleville, N. J. . . . or for more information check CP 5017 on handy form opposite last page.)

Multi-million dollar plant will develop alloys and castings

Multi-million dollar plant for development and pilot production of metal alloys and special castings is being built at Blairsville, Pennsylvania. The 480-foot long building will have facilities for basic metalworking processes of melting, forging, hot-rolling, cold-rolling, conditioning, pickling, and heat treating.

Plant will be equipped for such newer foundry techniques as investment and shell-mold casting. Powered metal parts will also be manufactured.

(Metals plant is being built by Westinghouse Electric Corporation, Dept. CP, 401 Liberty Avenue, Box 2278, Pittsburgh 30, Pa.)

Clear, flexible, chemically inert, tough, nontoxic, easily sterilized, Tygon Tubing is tops for laboratory and chemical plant use. Once you've tried it, you'll never be happy with anything else. If your dealer can't supply you, write direct: Plastics and Synthetic Division, The U. S. Stoneware Co., Akron 9, Ohio.

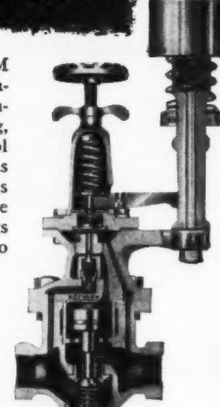
AT YOUR LABORATORY SUPPLY DEALER

TYGON *Flexible-Plastic* **TUBING**

When inquiring check CP 5018 opposite last page

FINER TEMPERATURE CONTROL THAN EVER BEFORE POSSIBLE

The Keckley Type PTM Modulating Pressure-Temperature Regulator controls temperatures in batch processing, air ducts and other control jobs with an exactness that has never before been possible. As temperature tends to vary, the thermostatic control unit acts upon the pressure regulator to reduce or increase steam pressure. Pressure will modulate smoothly and rapidly between initial setting and zero, thereby preventing overrun. Rate of pressure modulation is adjustable.



Send for Catalog 54-B — describes the complete Keckley line of Steam and Liquid Control Equipment.

Standard, interchangeable body and parts. Stainless steel Unit Pilot Valve, Main Valve and Seat.

O. C. KECKLEY COMPANY
400 W. Madison St. • Chicago 6, Ill.
KECKLEY CHICAGO

Pressure Regulators • Temperature Regulators • Float Valves • Strainers
Solenoid Valves • Reducing Valves • Pop Safety Valves • Relief Valves

When inquiring check CP 5019 opposite last page

No ink pen required with recorder chart that's waxed

Requiring no ink pen, waxed process-recording chart paper assures permanent tamper-proof records, skirts problem of data loss from pen clogging. As little as ¼ ounce force applied to stylus produces legible record line. Heated stylus is needed when force is less than ¼ ounce.

Coatings have melting point of 140°F, which is safe for about 99% of all graphic recording applications. Paper is available in various colors and can be adapted to roll, strip, and disc chart applications.

(Waxon chart paper is product of Waxon-Carboff, Inc., Department CP, 8 Commercial Street, Rochester 14, New York . . . or for more information reader may simply check CP 5020 on handy form opposite last page.)

New research tool — radioactive silicone

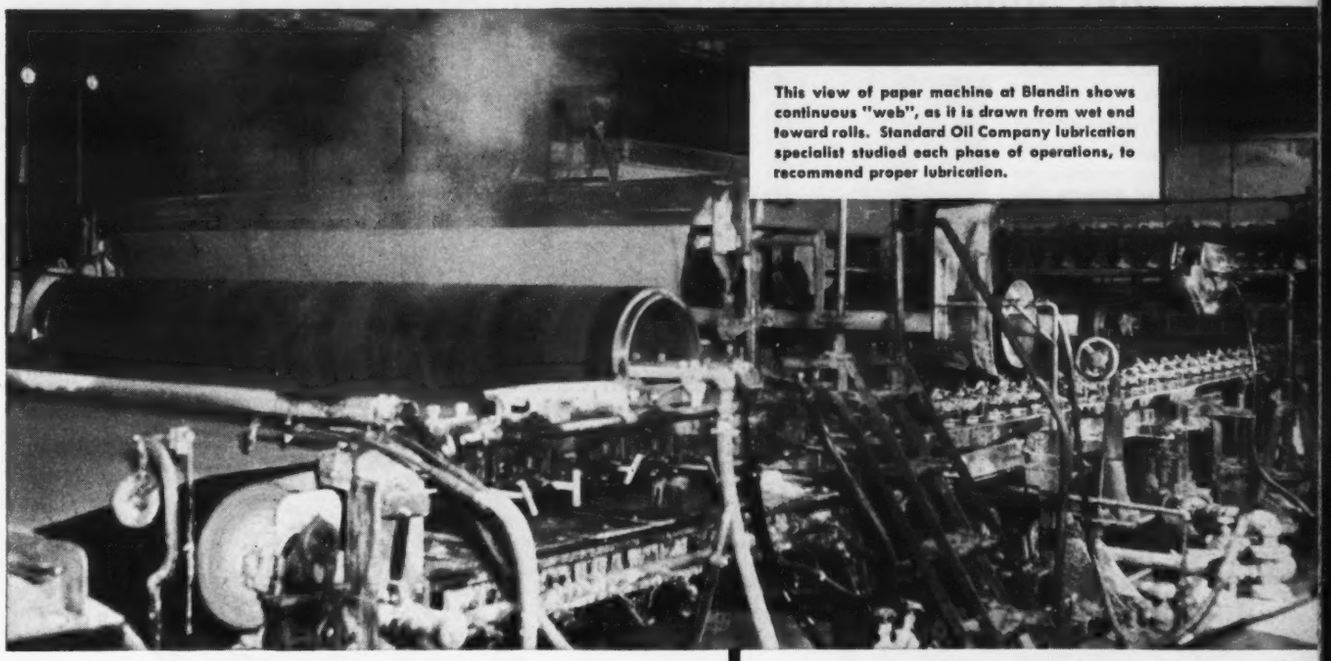
Radioactive silicone fluids may prove to be a valuable research tool in pharmaceutical, textile, cosmetic, and other fields. According to officials of Abbott Laboratories, North Chicago, Illinois, the fluids are made readily measurable in minute amounts by the incorporation of carbon-14.

Designed exclusively for laboratory and clinical test work, material is expected to offer a clearer insight into the behavior of silicones in the body.

(Project of manufacturing these silicones conducted jointly by Abbott Laboratories and Chemical Division, General Electric Company, Department CP, Pittsfield, Massachusetts.)

For more information on product at right, specify CP 5021 . . . see information request blank opposite last page.

STANOLITH GREASE *overcomes trouble spot, keeps paper rolling at* BLANDIN



This view of paper machine at Blandin shows continuous "web", as it is drawn from wet end toward rolls. Standard Oil Company lubrication specialist studied each phase of operations, to recommend proper lubrication.

STANOLITH Grease aided the solving of a rough lubrication problem at Blandin Paper Company in Grand Rapids, Minnesota.

A bottleneck on the paper making machines threatened production at this hustling paper plant four years ago. The trouble occurred near the beginning of the process, where the pulp contains up to 99% water. At this point, bearings are greeted by a shower of water and stock.

Greases were quickly lost, literally washed away. Bearings were ruined early in life. Not only had greases failed in their duty but they caused paper staining.

A Standard Oil lubrication specialist recommended STANOLITH Grease for use on the wet end of the paper machine. It did such a good job that Blandin maintenance personnel put this multi-purpose grease to work on other applications, too. Now, except when open gear and brick greases are required, STANOLITH serves the entire plant, replacing a wide number of single-duty products.

STANOLITH is truly a multi-purpose grease. It may be used almost anywhere on the job, in mechanical or hand-operated dispensers. STANOLITH Grease is heat and water resistant. It will reduce grease inventories, eliminate waste and prevent costly application errors. Find out more about how STANOLITH Grease can help you do many tough lubrication jobs with just *one grease!* In the Midwest call your nearby Standard Oil lubrication specialist. Or contact Standard Oil Company, 910 South Michigan Avenue, Chicago 80, Illinois.

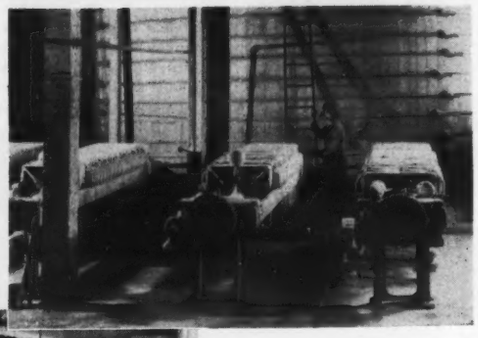
Blandin maintenance man, Fred Harwood (left), and I. A. Westerlund, Standard Oil lubrication specialist, inspect a table roll bearing. This is just one of many places in the plant where STANOLITH Grease provides top-efficiency lubrication.

I. A. Westerlund is a graduate of the University of Minnesota with an engineering degree. He is also a graduate of Standard's Sales Engineering School, and makes good use of his training in providing technical service to customers. He's been doing this for 14 years. His customers find this experience and training pay off *for them.*

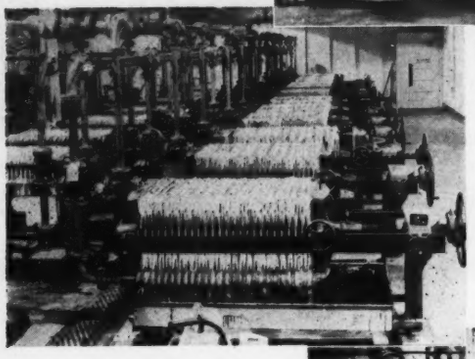
STANDARD

STANDARD OIL COMPANY (Indiana)

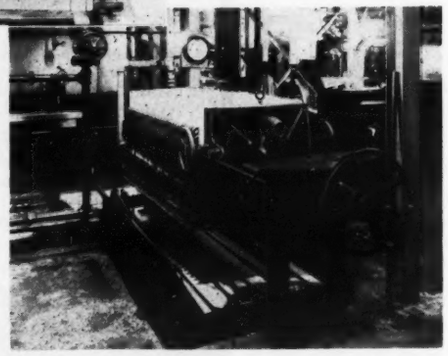
JOBS for FILTER PRESSES that improve processing



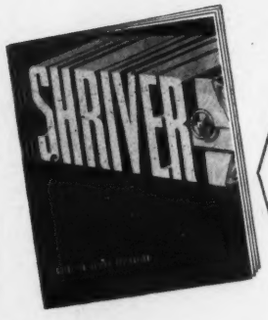
Recovery of firm filter cake free of soluble salts as in this Shriver installation for colors and pigments. The presses are equipped with individual outlet cocks for controlling flow of wash water to individual filter chambers.



Filtration of viscous materials as in this battery of Shriver filter presses for rayon, which permit using inexpensive, throw-away filter medium, reducing operating costs.



Filtration requiring high degree of clarity, as in the purification of edible oils in this Shriver filter press, where filter paper or pads are conveniently used.



There are many other applications where Shriver filter presses help the problem of cutting operating costs or improving product quality. The new issue of the Shriver Book gives you plenty of information, suggestions and aids. Get a copy . . . free.

T. SHRIVER & COMPANY, INC. • **846 Hamilton St., Harrison, N. J.**

Filter Presses · Filter Media · Diaphragm Pumps

Sales Representatives

Merco Centrifugal Co. San Francisco 7, Calif. | Process Eng. & Equipt. Co. St. Louis 19, Mo. | The Watts Co. Houston, Tex. | Richardson Agencies, Ltd. Montreal, Que.

When inquiring check CP 5022 opposite last page

IDEAS

Proof that people aren't obsolete

That machines don't make people obsolete is proved in a humorous, 22-page booklet entitled "The Adventures of Countersunk J. Lathe or What the Machine Tool is Doing for Civilization." The booklet is for employe distribution.

Story revolves around one C. J. Lathe, who has invented a "Widget," which he hopes will improve the standard of living in his home town of Inertia Under the Elms. Widgets are in immediate demand, but hand-producing methods are expensive and slow.

Bucking community disapproval, C.J. invents a machine to make Widgets. The fears of the people that this would create unemployment are changed to amazement when reduced prices of mass production create more demand, more jobs.

As demand increases, C.J. finally must invent a machine to make the machine that makes Widgets. So the story ends happily with the entire community busy, happy, and prosperous.

Author Mike Denyes points out the parallel of this story in several large American industries.

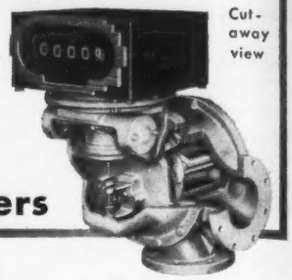
A sample copy of "The Adventures of Countersunk J. Lathe" can be obtained from Enterprise Publications, Dept. CP, 11 N. Wacker Dr., Chicago 6, Ill. Specify CP 5023 on handy form opposite last page.

Account For Corrosive Liquids

ALCOHOLS, VEGETABLE OILS, DEIONIZED WATER, ETC.,

with

Rockwell "316" Stainless Steel Meters



Cut-away view

Be Sure of Your End Product

Want the finest degree of *quality control* in your formulations? Need accurate *cost controls* over liquid ingredients? Is *inventory* a problem? Are *losses* eating into your profits? Then turn to a basic accounting tool—*Rockwell liquid meters.* Get the accurate metered records you need to operate efficiently. Available in a wide variety of types, materials and sizes to suit every requirement. Our bulletins tell all. Write today.

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When inquiring check CP 5024 opposite last page

Depend on

AUTO-LITE

for Temperature Indication

You Benefit from *Eye-Level Readings*

40 20 0 20 40 60 80 100
3-way adjustable mounting
Model F-1 temperature indicator
Auto-Lite offers many thermometer styles, permitting plant-wide temperature observation at low cost. Standard temperature ranges from minus 60°F to plus 750°F. Send for latest catalog showing various types.
Rigid stem or capillary tubing for EYE-LEVEL remote reading. Priced from $22.

THE ELECTRIC AUTO-LITE COMPANY
INSTRUMENT AND GAUGE DIVISION
TOLEDO 1, OHIO
NEW YORK • CHICAGO • SARNIA, ONTARIO

TEMPERATURE INDICATORS & RECORDERS

When inquiring check CP 5025 opposite last page

Mechanized disposal system requires only one driver to handle all refuse

Formerly: At Central Soya Company's big Decatur, Indiana soy bean processing and feed manufacturing plant, four men were kept busy collecting trash and debris, and disposing of it at a central pick-up station. Trucks would then periodically remove this accumulation and take it to the city dump.

Now: One man operates a single truck built for handling large transportable disposal containers. These large steel bin-like containers are assigned to each department of the plant. As trash accumulates, it is placed directly into these heavy receptacles. Each bin is covered by a lid or door.

Employe disposes of trash and refuse directly in conveniently placed bins . . .

Driver backs truck to container, attaches chains to lugs on either side. From cab he operates controls which lift container onto truck, position it, and lock it in place. Truck takes bin to disposal area, dumps it, returns it

Similar containers are used for collecting manure at Central Soya's experimental farms, where company's McMillan Master Mix feeds are tested. Truck which handles plant trash also picks up these containers.

A wide variety of sizes and designs of the portable containers are available for the specialized truck.

(Dempster-Dumpster system is manufactured by Dempster Brothers, Dept. CP, Springdale Ave., Knoxville 17, Tenn. . . . or for more information check CP 5026 on handy form opposite last page.)

THESE FLUIDS ARE DIFFICULT TO PUMP

ACETALDEHYDE	SODIUM CYANIDE	PROPIONIC ACID	SALT SOLUTIONS
ACETONE	SULFUR DIOXIDE	SULFURIC ACID	SODIUM SILICOFLUORIDE
FORMALDEHYDE	TRINITROCHLOROBENZENE	IODINE	HYDROGEN PEROXIDE
FREON	VINYLIDENE CHLORIDE	BENZOLCHLORIDE	HYDROCHLORIC ACID
MERCAPTANS	CHLOROSULFONIC ACID	BENZOLTRICHLORIDE	BROMINE TRIFLUORIDE
MERCURY	CHROMIC ACID	LIQUID BROMINE	CHLORINE
MOLTEN METALS	HYDROBROMIC ACID	CHLORACETIC ACID	CHLORINE TRIFLUORIDE
NAPHTHALENE (Molten)	NITRIC ACID	DILUTE ACIDS	FLUORINE GAS
NITRIC ACID	OLEUM	ALUMINUM SULFATE	HYDROFLUORIC ACID
PHOSPHORIC ACID	OXALIC ACID	DIATOMACEOUS EARTH SLURRY	HYDROGEN CYANIDE
		FERRIC SULFATE	HYDROGEN FLUORIDE
		SODIUM HYPOCHLORITE	FLUORINE
			SULFUR DICHLORIDE

THEY ARE HANDLED SUCCESSFULLY BY THE Lapp PULSAFEEDER

PISTON-DIAPHRAGM CONTROLLED-VOLUME CHEMICAL PUMP

Not competitive with any pump of more conventional design, the Lapp PULSAFEEDER is a highly specialized, precision, custom-built machine suited to a wide variety of special applications involving controlled-volume pumping of fluids.

Basic feature of Lapp PULSAFEEDER design is its combination of reciprocating piston action (to provide the accuracy of positive displacement) with an hydraulically balanced diaphragm which isolates material being pumped from working pump parts—and, of course, eliminates need for stuffing box or running seal.

Control of pumping rate is achieved at constant pumping speed; variable flow results from variation in piston stroke length—adjustable by hand-wheel, or, in Auto-Pneumatic models, by instrument air pressure responding to any instrument-measureable processing variable.

Justification for this specialized premium construction is evident in the many, and varied, applications in which Lapp PULSAFEEDER alone is able to perform satisfactorily. In fact, the economies of continuous processing, automatic proportioning, feeding and filling in many operations are possible only because of the unusual characteristics and peculiar advantages of Lapp PULSAFEEDER.

In general, use of the Lapp PULSAFEEDER is indicated for continuous (or intermittent) pumping, at accurately controlled volume, of fluids which cannot be satisfactorily exposed to conventional pistons, cylinders and stuffing box packing—because of the corrosive action of chemicals being handled and/or need for protection of product against contamination.

Lapp Bulletin 440 shows typical applications and flow charts. It describes and lists specifications of models over a wide range of capacities and special constructions. Also included is an Inquiry Data Sheet, from which we can make specific engineering recommendations for your processing requirement. For your copy write Lapp Insulator Co., Inc., Process Equipment Div., 364 Wilson St., Le Roy, N.Y.

When inquiring check CP 5027 opposite last page

3-WAY VALVES
FOR INTERCHANGE OR DIVERSION OF FLOW

This 3-way, twin butterfly valve, controlled by an air operator, is used in the inlet water line of a cooling tower to divert flow to the upper tower reservoir section.

It is one of many Rockwell manual or automatic valve types for handling air, gases, liquids and semi-solids at required operating pressures and temperatures.

Write for Catalog.

W. S. ROCKWELL COMPANY

ROCKWELL SINCE 1888 BUILT

BUTTERFLY VALVES • SLIDE VALVES • AUTOMATIC VALVES

2205 ELIOT STREET • FAIRFIELD, CONN.

Sales Representatives in Principal Cities

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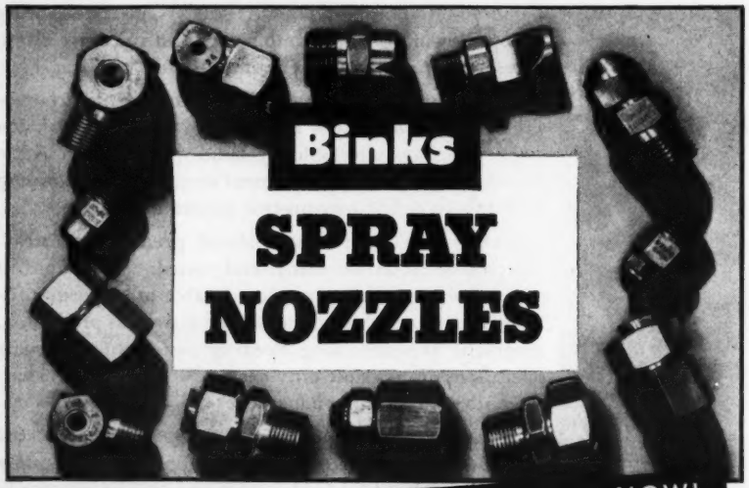

for chemical spraying, cooling, humidifying, dehydrating, and hundreds of other applications.

You'll get the right nozzles quicker by calling Binks...manufacturers of one of the most complete nozzle selections ever produced.

You'll have a wide range of spray patterns, sizes, capacities from which to choose...with nozzles cast or machined from any standard or special corrosion-resistant metals. Send for comprehensive catalog.

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O.K. Binks, send me your Spray Nozzle Catalog...

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When inquiring check CP 5029 opposite last page

How to give orders told in booklet

Illustrated 24-page booklet offers concrete suggestions to supervisors who delegate orders to plant or factory employes. Down-to-earth points expounded in booklet are based on four simple rules: 1) make order clear and complete, 2) make it fit the person, 3) make it businesslike, and 4) make it easy to take.

To obtain "You Can Give Orders That Get Action" remit 25c direct to National Foremen's Institute, 100 Garfield Avenue, New London, Conn.

Ti alloy 40% lighter than steel

Lightweight titanium alloy, containing 6% aluminum and 4% vanadium, may replace steel in military weapons. About 40% lighter than steel, it is heat-treatable to tensile strengths up to 192,000 psi — about 42,000 psi stronger than any commercial alloy of titanium being produced.

Tests show that alloy is highly resistant to corrosion and has properties which compare favorably with those of steel. Impact properties and weldability are good.

(Titanium alloy was developed for Army Ordnance Corps by Armour Research Foundation, Illinois Institute of Technology, Dept. CP, 35 West 33rd Street, Chicago 16, Illinois.)

Improved steelmaking process discussed

Improved oxygen steelmaking process is described in illustrated 14-page brochure.

"Oxygen Steelmaking in the US" is issued by Kaiser Engineers, Division of Henry J. Kaiser Company, Dept. CP, 1924 Broadway, Oakland 12, California. When inquiring specify CP 5030 opposite last page.

Add 160 BOILER HORSEPOWER
OF ADDITIONAL STEAM
in no space at all*

That's one big advantage of the new Vapor Modulātic Steam Generator—it's so small you can virtually hide it. Even the 160-h.p. size takes only 5′ x 8′ floor area.

Moving a desk makes room. Or folding up the watchman's cot. Or any aisle will do. You don't have to worry about a special foundation, an expensive stack, a separate enclosure. Put it anywhere. For 23 years, railroads have used similar Vapor units for heating Diesel Streamliners. There's no better testimonial.

MANY ADVANTAGES

The new Vapor Modulātic is a special adaptation for industrial uses of the famous railroad-type unit. Press a button — there's steam in two minutes. It's shipped completely assembled, passes through plant-type doorways. Just wheel it in, connect it up. Operation is automatic, no wastage.

Ratings, 18 to 160 h.p. for oil, gas, or oil-gas combination. Pressure selection, 5 to 285 p.s.i., or even much more. Efficiency, 78-82%. If you need steam for heating, power, or processing—whether space be your problem or not—ask for new Modulātic Bulletin No. 586. See how simply your problem is solved.

VAPOR MODULĀTIC VERTICAL STEAM GENERATOR

*No space you're now using or should ever need for any other purpose.

VAPOR HEATING CORPORATION
80 E. Jackson Blvd., Chicago 4, Ill.
In Canada: Vapor Car Heating Co. of Canada, Ltd., 65 Dalhousie St., Montreal 3

When inquiring check CP 5031 opposite last page

Precision glass screens contain 90,000 holes per square inch . . .

made from photosensitive glass, used as component for cathode ray tubes

Currently being used as part of cathode ray tubes, small 300-mesh precision glass screens contain over 200,000 square holes so small they cannot be threaded by a human hair. Covering an area of approximately 2¼ square inches, screens contain 90,000 holes per square inch.

Screens are made from a photosensitive glass (called "Fotoform") that can be formed and cut with photographic precision. After screen has been formed, the glass is converted to "Fotoceram", a material two to three times stronger than the parent glass. Process can be adapted for partial or complete cutting of glass in any pattern than can be reproduced photographically.

Prior to use of glass, the cathode ray tube components were usually made of copper. Glass screens offer sharper definition and simplify manufacturing and conductivity problems.

(Screens are made by Corning Glass Works, Dept. CP, 1949 Crystal Street, Corning, N. Y. . . . or for more information check CP 5032 on handy form opposite last page.)

Package polyvinyl chloride plant using suspension process operating overseas . . .

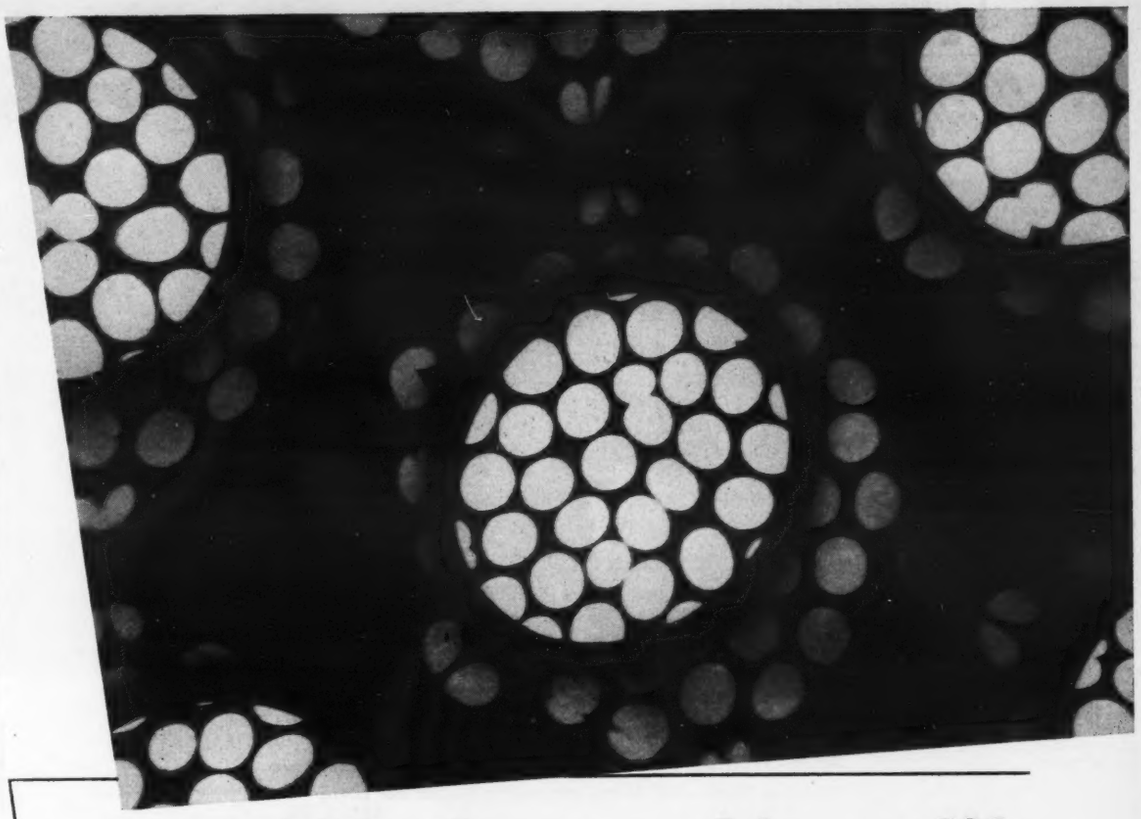
process developer offers designs for capacities of 4 to 15 million pounds a year

Series of "package" process designs for low-budget polyvinyl chloride plants has been announced. Employing suspension process developed by Scientific Design Company, Inc., New York, N. Y., in collaboration with a European firm, capacities of plants range from four to fifteen million lb/yr.

Process is reported to be an advance on earlier emulsion technique of PVC production. Suspension PVC is said to have faster reaction and drying times, fewer impurities, and is less costly to manufacture. Heat stability, film clarity, water resistance, and other important properties are also improved over those obtained by emulsion process.

European plant is operating successfully. Quality of resin is said to compare favorably with best PVC produced in this country.

(Packaged PVC plants are development of Scientific Design Company, Inc., Dept. CP, 2 Park Avenue, New York 16, New York . . . or for more information reader may simply check CP 5033 on handy form opposite last page.)



22,000 times as big as life

to show one why of Dicalite's "sharp" filtration

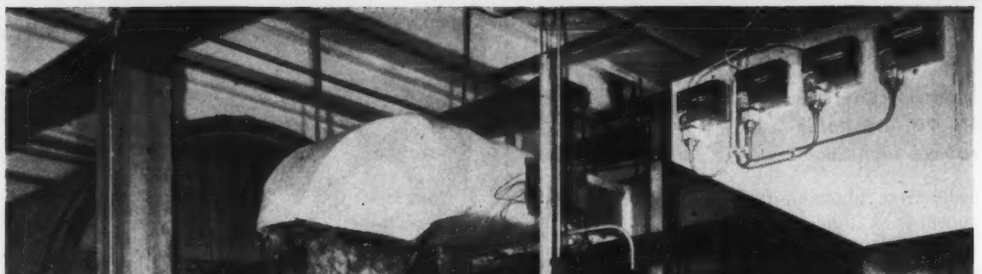
This electron micrograph of one of the more than 10,000 kinds of diatoms shows clearly the delicate, yet rigid, "skeleton" whose lace-like grid helps make diatomite such a superior filteraid. Imagine, for a moment, millions of these diatom frustules—needle-, disc- or boat-shaped—piling up strawpile fashion in the filter pre-coat or filtercake . . . then visualize bacteria or other sub-micron sized solids (enlarged to the same scale) coming against this barrier. Now, in your mind's eye, you can see clearly how the diatomite "grillwork" catches and holds all solids, while the fluid being filtered flows rapidly on through the billions of tiny channels which make up 90% of the filtercake's bulk.

Many processes and products in the chemical, industrial, food and pharmaceutical fields would be practically impossible without this "sharp" filtration provided by high-quality diatomaceous filteraids such as Dicalite. These Dicalite filteraids, processed under rigid controls from the highest quality diatomite, afford a complete range of uniform, sterile, chemically-inert products for the filtration of almost any liquid. They have provided the answers to many processing problems—they could well be the answer to yours. We will be glad to furnish full information, samples adapted to your requirements, or technical engineering aid if required.

Dependable GLC GREAT LAKES Dicalite® DIATOMACEOUS MATERIALS

DICALITE DIVISION GREAT LAKES CARBON CORPORATION • 612 S. FLOWER ST., LOS ANGELES 17, CALIFORNIA

When inquiring check CP 5034 opposite last page



Full automatic control of this hot mill . . .

cuts drying time in half

while improving leather quality

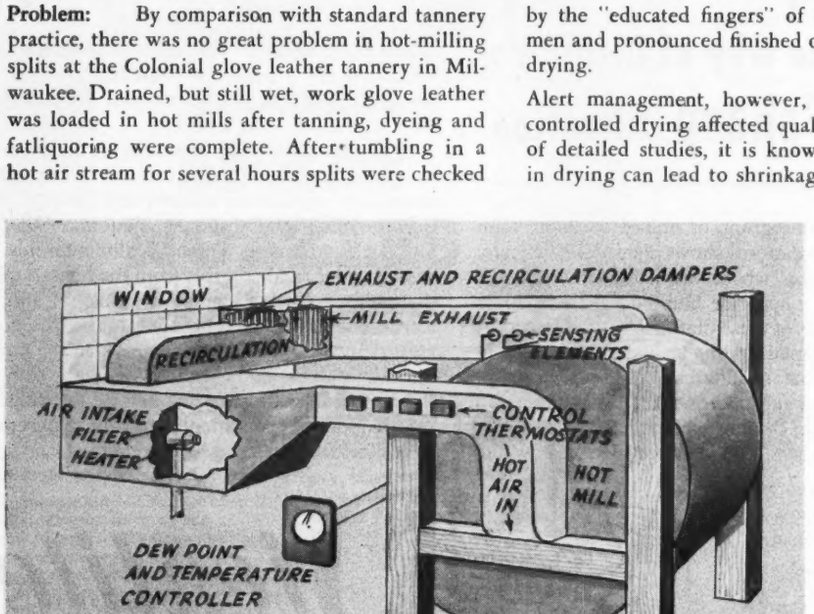
Direct-fired drying system is controlled for heat input, running time, and fresh air-recirculated air ratio

SAUL LEVINE
Plant Manager, Glove Leather Div.
Colonial Tanning Company
with **BRUCE FADER,** Associate Editor

Problem: By comparison with standard tannery practice, there was no great problem in hot-milling splits at the Colonial glove leather tannery in Milwaukee. Drained, but still wet, work glove leather was loaded in hot mills after tanning, dyeing and fatliquoring were complete. After tumbling in a hot air stream for several hours splits were checked by the "educated fingers" of experienced tannery men and pronounced finished or consigned to more drying.

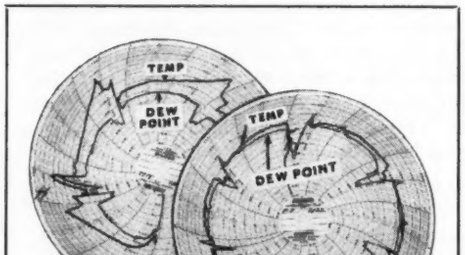
Alert management, however, wondered how uncontrolled drying affected quality. Despite the lack of detailed studies, it is known that poor control in drying can lead to shrinkage, poor feel, lack of body. And besides this, guesswork in drying means extra drying time "to be sure." This extra drying time, they felt, could be just as well used in drying *extra loads.*

Solution: Drying control, as it was installed by Colonial, was a pioneering effort in tannery practice. As such, it entailed all the usual problems of doing something that had not been done before. Discussions between tannery management, consulting engineer Robert Rodwell, and instrument specialists pinned some of these problems down.



Artist's sketch is simplified to show principal parts of hot mill control system

Chart at left shows how mills operated before control was applied. These are records of runs made with manual control. Chart at right shows how exit gas temperature (TEMP line) is maintained constant



Speed of drying was a primary consideration. In order to attain it, they devised a direct-fired (gas burner) system where air entered the mill at high temperature. Since at the start of a run leather is sopping wet, this high temperature produces no ill effects. As splits become drier, though, this temperature has to be tapered off. Simple self-regulating way of doing this is to sense *exit* temperature of air from the mill. With less water (hence less cooling) to supply, drier leather does not lower air temperature as much.

But with high temperature available and rapid drying, designers had to consider "case hardening" of the leather. If outer surfaces became dry and hard, it would be a slow process driving water from the inside through them. To get around this, they planned to control humidity (really dew point) of the drying air. A dew point sensing element on the exit side drives a controller which positions two dampers in air circulating system. Thus ratio of fresh to recirculated air is controlled for constant dew point.

Both controllers are embodied in a two-point controlling roundchart recorder.

This designing solved control problems. Next step was to make the operation automatic. A set of four thermostats was used here. First thermostat acts as a holding contact during startup. It keeps fan running for three minutes to sweep air system clean. After this holding period, second thermostat starts the burners and demands that minimum air input temperature be held. If input air gets dangerously hot, third thermostat will shut off the mill and light an alarm signal.

When leather reaches final dryness, input air temperature has been lowered by controller to a figure close to the exit temperature. This low temperature sets off final thermostat which cuts the burners and lets fan circulate cool air for a prescribed period. Final shutdown of the mill is also automatic.

Results: A few months of operation were required to get bugs out of the system. In the several months since then, drying time in the hot-mill has been just about cut in half — though the actual time per load depends on weight of load and wetness to start. Besides using the mills to best advantage productionwise, Colonial management notes that leather shrinkage is small and predictable. Body of the leather has improved.

Fully automatic operation has netted another bonus. By loading mills near quitting time, tannery is able to dry one extra load a day in each. Mill simply runs at night until it has finished drying the leather perfectly, then shuts itself off. Mill is dumped, reloaded in the morning.

(Combined temperature-dew point recording controller is a pneumatic Stabilog supplied by the instrument company which engineered this installation — The Foxboro Co., Dept. CP, 38 Neponset Ave., Foxboro, Mass. . . . or for more information check CP 5035 opposite last page.)

Richardson

AUTOMATIC PROPORTIONING

. . . 50 years of automatic weighing experience covering more than 400 different materials

. . . life-testing of electronic components in the lab, for maximum performance in the plant

. . . materials flow research and test facilities to coordinate material characteristics with system design

. . . a development lab working out new and better methods in automatic proportioning

. . . integration of all equipment and accessories into a complete coordinated system

. . . system completely wired and tested with test material before shipment

. . . single responsibility for the entire system, with nationwide service facilities.

A prominent mid-western firm manufacturing rubber products has installed this Richardson system for remote control of formulation in the batching process. The 43 different ingredients handled include pelletized rubber, pigment fillers, accelerators, carbon blacks, and staining and non-staining oils. Solid ingredients are remotely selected and discharged from storage bins via Richardson automatic scales to a collector conveyor below. Oils are also remotely selected, and after discharge from automatic scales to pressurized surge tanks, are fed together with solids to a Banbury mixer.

One man operates this proportioning system which is fully protected from motor failure, human error, materials shortages, circuit interruptions and similar difficulties by an indicating alarm system. Control panel switches allow transfer, if desired, of the entire system to manual operation. Electrical interlocks halt the process if any major element (i.e. Banbury temperature or air pressure) fails to meet operating requirements. In the event of such deviation, or power failure, operation may be resumed from the point of interruption without recycling. Clean-out circuits are provided.

For complete case history file of Select-O-Weigh installations in industry, please ask for Bulletin 0351.

Richardson

MATERIALS HANDLING BY WEIGHT SINCE 1902

RICHARDSON SCALE COMPANY
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Atlanta • Boston • Buffalo • Chicago • Cincinnati • Detroit
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1202

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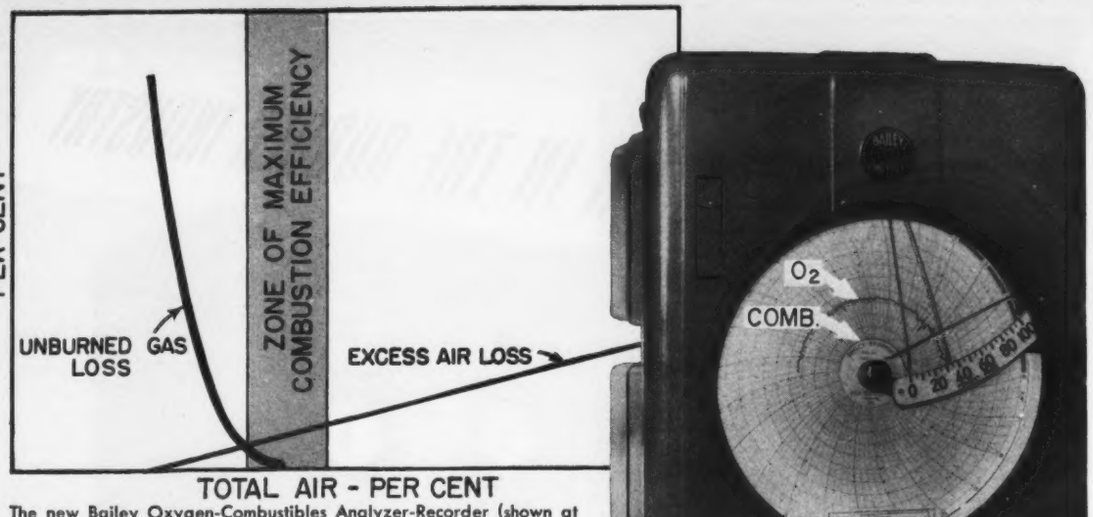


The new Bailey Oxygen-Combustibles Analyzer-Recorder (shown at right) provides a continuous two-in-one check of combustion efficiency by recording both oxygen and combustibles in flue gas. As shown by above chart, both measurements are needed to determine combustion efficiency.

BAILEY announces . . . New 2 in 1 way to measure Combustion Efficiency

The new Bailey Oxygen-Combustibles Analyzer-Recorder gives you a continuing double check on combustion economy. It's fast response measures and records:

1. Excess air—regardless of the fuel or combinations of fuels being burned.

2. The mixing efficiency of your fuel-burning equipment—by indicating the amount of combustibles in your flue gas, resulting from incomplete mixing of fuel and air.

Combustion efficiency depends upon fuel-air ratio. Too much fuel can be even more costly than too much air. And because of the interdependence of these two factors, no control that measures only one of them can give you complete protection.

Now, for the first time, you can check *both* with a *single* fast acting instrument, using the new Bailey Oxygen-Combustibles Analyzer-Recorder for industrial furnaces, kilns, heaters and boilers.

Fuel economy improves as excess air is reduced —until unburned fuel begins to show up in the flue gas. When this happens, combustion efficiency drops off sharply if there are further decreases in the air-fuel ratio. That's why combustion gases must be analyzed for *both* oxygen and combustibles to get a true indication of efficiency—and that is why Bailey coordinates both measurements on the same chart, to show when excess air may be reduced safely without danger of greater losses from unburned gases.

The Bailey Oxygen-Combustibles Analyzer is an approved combustion safeguard.

Ask your local Bailey engineer for suggestions on application. Equipment details in Product Specifications E65-1 and E12-5. P31-1

BAILEY METER COMPANY

1074 IVANHOE ROAD • CLEVELAND 10, OHIO

INSTRUMENTS AND CONTROLS — For Power And Process

When inquiring check CP 5037 opposite last page

Presents line of instrument panels and test stands

Illustrated bulletin of six pages covers instrument test stands and panels. Company will build its own line or conventional control and test equipment to buyer's exact specifications.

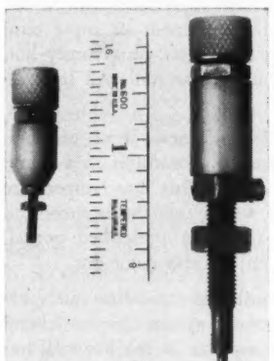
Bul 541 is issued by Industrial Engineering Corp., Dept. CP, 2720 Vine Street, Cincinnati, Ohio. When inquiring reader may simply specify CP 5038 on handy form opposite last page.

Measures rapid temperature changes under pressures to 60,000 psi and severe vibration . . .

units may be installed in cylinder and piston walls, autoclave walls, and air ducts

Uses: For measuring extremely rapid temperature changes in regions of high stress.

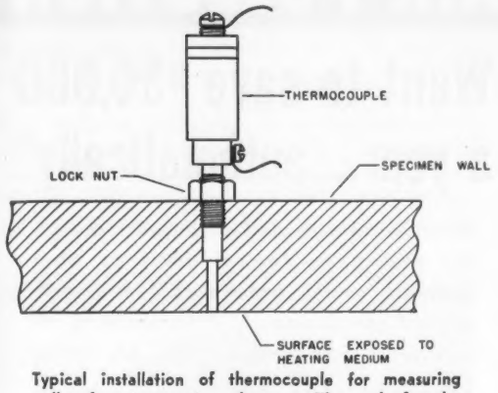
Features: Thermocouple has been tested at pressures up to 60,000 psi under severe mechanical vibration. Time constant (time required for junction temperature to reach 63.2% of amplitude of step-temperature change of exposed plating surface) is approximately 0.25 microsecond.



Sensitive surface of thermocouple is on extreme lower end of probe

Description: Major components of thermocouple are probe, body, terminal posts, and insulator. Probe consists of thick-walled steel tube plated on one end with 1 μ of nickel. Interface between nickel plating and underlying end of steel tubing is plane at which thermal EMF is generated. Lead wire (nickel) to plating is mounted in center of tubing. Wire is coated with oxide of nickel which serves as electrical insulation between wire and steel tubing. Diameter of probe is 0.090" with lengths varied from 5/16 to ½".

Probe is held in steel body equipped with external threads which are used to mount unit. Body also contains binding post for attaching external steel lead wire. Since the only electrical contact desired between nickel and steel is that existing at hot junction, lucite insulator is employed between steel



Typical installation of thermocouple for measuring wall-surface temperature shows sensitive end of probe aligned with exposed surface of specimen wall

body and nickel terminal post. Internal nickel lead wire from probe is insulated throughout its length from steel parts of thermocouple, and is clamped to terminal post. Overall length of thermocouple is approximately 3″.

If temperature change is sufficiently slow, hand-balanced potentiometer may be used to record thermocouple output. For rapid transients, a cathode-ray oscilloscope with associated amplifiers is necessary.

(Transient Temperature Thermocouples are a development of Midwest Research Institute, Dept. CP, 4049 Pennsylvania St., Kansas City 11, Mo. . . . or check CP 5039 opposite last page.)

Gasketed housing protects pressure controller from weather . . .

zinc-plated case and parts withstand salt spray test for 50 hours

Uses: For controlling pressures where controls must be located outdoors or in locations where moisture or chemical splash are a problem.

Features: Instrument case conforms to NEMA specifications as being drip-tight, weather-resistant, and water-tight. Case and complementary parts are heavily zinc-plated and treated with passivating chromatic film. Finish withstands 50 hour salt spray test.

Description: Series DAW weather-resistant pressure controllers are equipped with sealed mercury contacts. Controls are available in 17 operating ranges from 30″ vacuum to 300-2500 psi with sensitivities from 2 oz to 20 psi, depending upon pressure range.

(Series DAW pressure controllers are a product of Mercoid Corp., Dept. CP, 4201 W. Belmont, Chicago 41, Ill. Check CP 5040 opposite last page.)

MASTROL SYSTEM for Forced Hot Water Heating
OUTDOOR MASTER CONTROL
INDOOR SUB-MASTER REGULATOR
Pneumatic Switch
PNEUMATIC CONTROLS
Series 100 Recording Controller and V-Port FLOWRITE Control Valve
PNEUMATIC CONTROLS
Thermostat
Hygrostat
LIMITEM Thermostat
3-Way FLOWRITE Valve
Series 100 Indicating Controller
FLOWRITE Diaphragm Valve Single Seat
Convector and Unit Air Conditioner Valves
Packless Type
3" POWERSTROKE Damper Operator
Static Pressure Controller
6" POWERSTROKE Damper Operator
POWERS
TEMPERATURE and HUMIDITY CONTROL
For Heating and Air Conditioning Systems Industrial Processes
Water Heaters • Heat Exchangers Jacket Water Cooling
All Types of Baths Hospital Hydrotherapy
Most of your control problems can be solved sucessfully with the aid of a POWERS engineer and the proper application of some of our modern products. Why not profit from our 60 years of experience? There's no obligation. Phone or write our nearest office.
No. 11 Self Operating Temperature Regulator
Available with Single or Double Seat and 3-way Mixing Valve
ACCRITEM Temperature Regulator
Compressed Air or Water Operated
No. 11 Temperature Indicating Regulator
Self Operating
Self-Operating
Thermostatic Water Mixers
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THE POWERS REGULATOR CO.
Established 1891 • Offices in 60 Cities • See Your Phone Book
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LOS ANGELES 26, CALIF. • 3200 West Temple St.
TORONTO 15, ONTARIO • PO Box 182, Weston
MEXICO CITY, D. F. • Apartado 63 Bis

When inquiring check CP 5041 opposite last page

WHY SHOULD I USE T-E'S SELF-BALANCING INDICATOR?

TO READ A LOT OF TEMPERATURES QUICKLY AND ACCURATELY.

LARGE CAPACITY
Several hundred thermocouples or resistance bulbs can be connected to T-E's indicator through toggle switches, rotary switches, or connector panels. Switches are housed in a separate case identical to the indicator case. Capacity is 50 to 160 points. For less than 50 points a smaller case can be used, for over 160 points, 2 or more cases can be supplied.

EASY-TO-READ
Large, 34" scale has from 400 to 600 widely spaced graduations for accurate and easy reading. Hairline is close to dial, minimizes errors from parallax.

SPEEDY
Full scale travel only 4 seconds. Balances rapidly at temperature value.

23 SCALE RANGES
From −320° to +200°F all the way up to 0° to 3000°F.

ACCURATE
±¼ of 1% of scale range.

SENSITIVE
1/20 of 1% of scale range.

DURABLE
Simple design keeps maintenance low and instrument life long. Only 2 moving parts, the motor and the shaft carrying dial, slidewire, and drive gear. Slidewire is enclosed to protect it from dust or electrical interference.

Interested? Write for bulletin 61-R.

Pyrometers • Thermocouples • Protection Tubes • Quick-Coupling Connectors
Thermocouple and Extension Wires • Resistance Bulbs • Connector Panels

Thermo Electric Co., Inc.

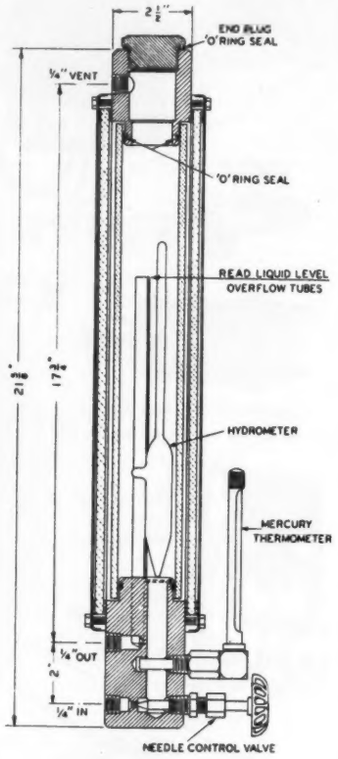
SADDLE RIVER TOWNSHIP, ROCHELLE PARK POST OFFICE, NEW JERSEY
IN CANADA—THERMO ELECTRIC (Canada) Ltd., BRAMPTON, ONTARIO

When inquiring check CP 5042 opposite last page

Hydrometer in enclosure slides on metal track to indicate sp gr . . .

liquid controlled by needle valve; lug prevents rotating

Specific gravity indicator is designed for rapid and accurate determination of specific gravity or liquid densities. Liquid flow enters instrument through lowest ¼" connection and is controlled by needle valve. It flows past thermometer into glass tube containing hydrometer. Liquid overflows into



two tubes and is discharged out connection just above inlet (see drawing). Lug on hydrometer prevents it from rotating — keeping hydrometer scale facing to front for best readability.

(Spee/Gee specific gravity indicator is a product of Brooks Rotameter Co., Dept. CP, 47 Dennison Ave., Lansdale, Pa. . . . or for more information reader may simply check CP 5043 on handy form opposite last page.)

AIR POLLUTION

Want to save $30,000 a year...automatically?

New, wind operated automatic controller energizes forced draft or heat systems under unfavorable meteorological conditions . . . thus shutting off scrubbers when not needed. It's called the Bendix-Friez Windtrol.*

If you're one of those plants that takes its community public relations seriously, when it comes to air pollution...

And if you keep your scrubbing equipment operating continuously to forestall air pollution . . .

Then we've got some good news for you.

The established principles of stack meteorology, based on Bendix-Friez case histories, can save you as much as $30,000 a year.

Unfavorable Quadrants

By checking wind speed and direction, the unfavorable quadrant for stack effluents can be discovered and controlled automatically. This unfavorable condition of air pollution may be only 25% of the time.

Shut Off Automatically

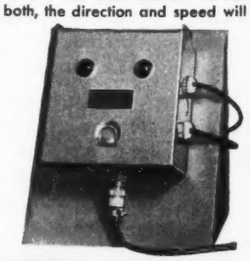
Thus, instead of running your scrubbers constantly at a cost of $40,000 . . . they are shut off automatically by the Windtrol Transmitter.

Easily installed. The transmitter is at stack height. The controller is located indoors on any convenient wall.

How It Works

The transmitter of the Windtrol has been constructed so that the controller circuit is energized when the wind speed is less than a selected value, and the wind direction is from a specified arc. Normally, it is wired so that both conditions must exist simultaneously for the circuit to be energized.

Observations indicate that many situations will arise because of the gustiness of the wind in which either or both, the direction and speed will oscillate rather rapidly in the vicinity of the selected limits. This could result in intermittent and short period closures of the controlling circuit, were it not for a built-in time delay device which causes the actuating power relay to remain open or closed for a given length of time after the direction or speed has changed from the required limits.



For Further Information . . . Write Today.

*REG. U.S. PAT. OFF.

Bendix - Friez
FRIEZ INSTRUMENT DIVISION OF BENDIX AVIATION CORPORATION
1450 TAYLOR AVENUE, BALTIMORE 4, MARYLAND
Export Sales, Bendix International Division, 205 E. 42nd St., New York 17, N. Y., U. S. A.

When inquiring check CP 5044 opposite last page

Mechanically computes metered flow of gases, steam or liquids from orifice charts

Flow integrator is designed for computing metered volume of gases, steam or liquids from orifice meter charts. Electrically-operated instrument has counter setback assembly which operates from main calibration post. This enables operator to run practically all

Operator calculates orifice meter chart on integrator

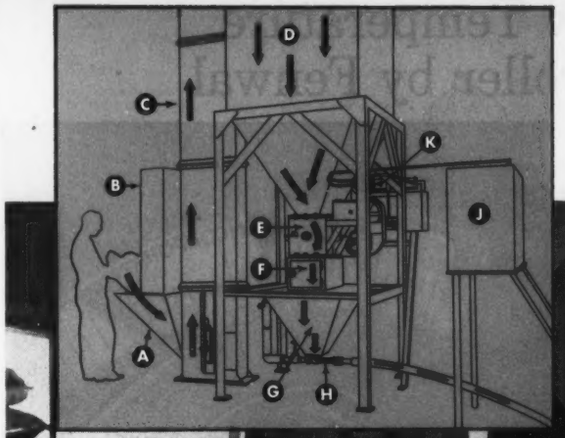
ranges of charts at any base pressure. When integrator is in calibration for one make of chart, it is calibrated for all other makes for that machine.

Range settings are almost infinite in number, as compared with limited number of range holes in older model integrators in manufacturer's line. For greater resistance to wear, points of motion or pivot points have been set in ball bearings, eliminating shaft-through-sleeve points of former models.

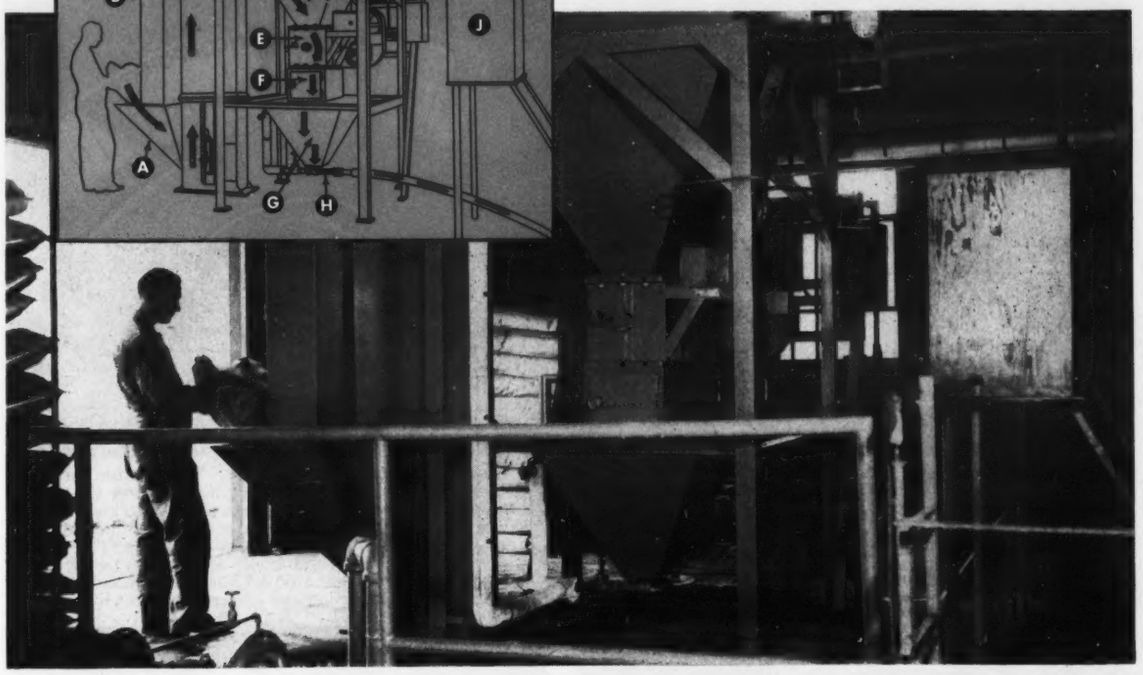
(Flow integrators are products of Rockwell Manufacturing Co., Dept. CP, 400 N. Lexington Ave., Pittsburgh 8, Pa. . . . or for more information check CP 5045 on handy form opposite last page.)

Need instrumentation for that process?

You'll find just what you need in the alphabetized, itemized Product Directory on pages 217 to 220. All subjects and products presented in ads and editorial columns are there.



Omega Continuous Chemical Feeding System includes: (A) loading hopper, (B) dust collector, (C) bucket elevator, (D) storage hopper with low level alarm, (E) Rotolock Feeder, (F) inspection chute, (G) dissolving chamber, (H) ejector for delivering chemical solution to raw waste channel, (J) pH controller, and (K) pneumatic positioner for varying feed rate in proportion to pH.



CONTINUOUS WASTE NEUTRALIZING THE EASY, OMEGA WAY

WOLVERINE TUBE Division of Calumet & Hecla, Inc., at Decatur, Ala., uses this Omega Continuous Chemical Feeding System to neutralize acid pickle liquor wastes. As shown in the drawing, the system is a "load it, forget it" combination of standard Omega units engineered for continuous, automatic operation. Soda ash is fed by an Omega Rotolock Feeder in response to a pH Controller — at rates varying over a 15 to 1500 lbs. per hr. range. The Rotolock Feeder's high volumetric accuracy (within ±1%) and wide range insure proper waste neutralization under all flow conditions.

This system—selected from the many available Omega chemical feeding "equipment packages" — was engineered in cooperation with Howard, Hickerson and Jordon, Engineers-Architects, of Nashville, Tenn. Omega welcomes the opportunity of working with you and your engineers in the application of Omega Feeders to your chemical feeding problems.

Send Coupon

OMEGA THE LAST WORD IN FEEDERS
DIVISION OF B-I-F INDUSTRIES, INC. METERS FEEDERS CONTROLS

OMEGA MACHINE COMPANY, 3878 Harris Ave., Prov. 1, R. I.

☐ Send Bulletin 45-H8 describing Omega Rotolock Feeders.

☐ Send "Industrial Waste Treatment Guide" (Bulletin BIF-4A)—also details on other Omega waste treatment "packages".

Name.....

Company.....

Street.....

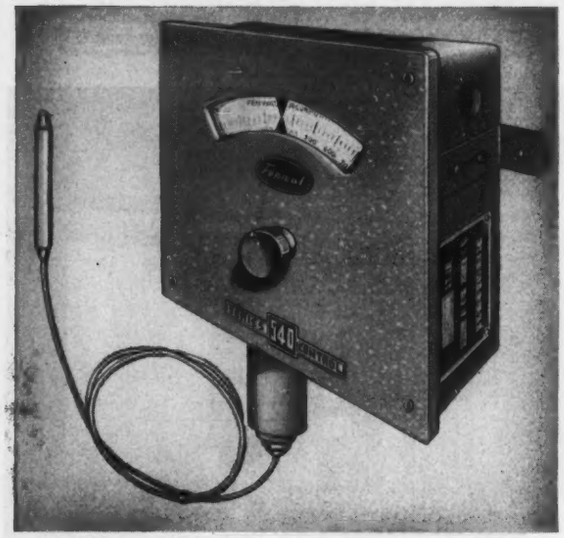
City..... State.....

Our chemical feeding problem involves .....

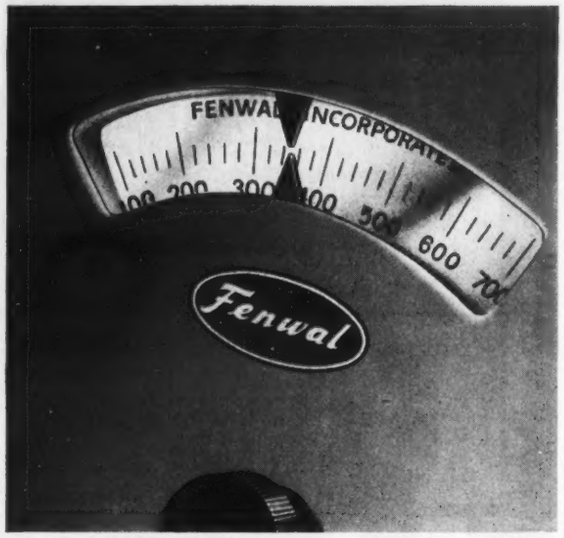
.....

When inquiring check CP 5046 opposite last page

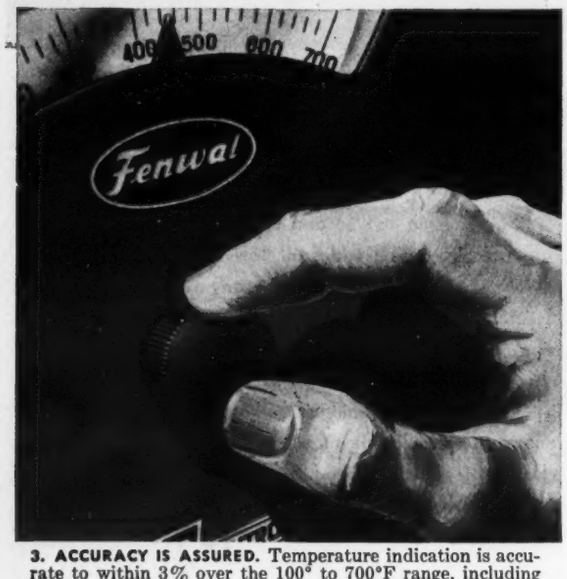
Now . . . a new Temperature Indicator-Controller by Fenwal



1. FENWAL'S NEW SERIES 540 is a remote Temperature Indicator-Controller that combines low cost with high accuracy over a temperature range of 100° to 700°F. Designed for ovens, packaging and processing equipment of all types, the new controller operates on a liquid-filled bulb and capillary system whose response to temperature changes is transmitted through a bellows to an indicating pointer. It may be flush-mounted or surface-mounted.



2. "SET" AND "CHECK" ARE EASY. Temperature setting pointer and bulb temperature pointer pivot on the same axis, indicating against the same scale face. This permits "glance" comparison of actual and set-point readings at considerable distance from the dial. An adjustable differential, variable between 0.8% and 4% of scale range, permits adjusting the operating bandwidth to balance closeness of control against slower cycling and longer equipment life.



3. ACCURACY IS ASSURED. Temperature indication is accurate to within 3% over the 100° to 700°F range, including the effects of ambient temperature in the range of 50° to 150°F. Accuracy increases for narrower ranges. Uniform control and accurate calibration are maintained with typical Fenwal precision in this new, popular-priced addition to a famous line of temperature control and detection devices.

4. SEND FOR NEW BULLETIN. Get all the facts on how closely the new Series 540 meets your requirements for an economical, accurate indicator-controller. Write for comprehensive bulletin MC122. And remember, we're always ready to help in any problems concerning temperature control and detection. **Fenwal Incorporated, 242 Pleasant Street, Ashland, Mass.**

Fenwal Controls Temperatures . . . *Precisely*

When inquiring check CP 5047 opposite last page

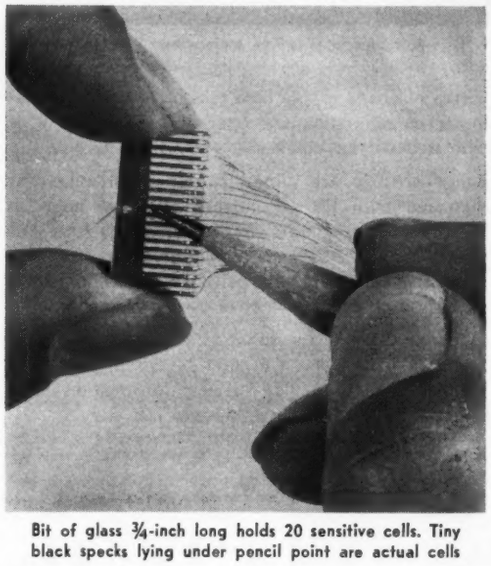
Detect UV, visible, and IR rays with photoconductive cells made of lead sulfide . . .

cells give 10,000 times more sensitivity to infrared than previous detectors

Uses: For detection of ultraviolet, visible, and infrared rays. Cell reaches its peak of sensitivity in the invisible heat rays of near-infrared, making it useful as heat detector.

Features: Miniature cells offer ten thousand times as much sensitivity to certain infrared rays as previous laboratory instruments. Cells may be arranged to operate complex combinations of electrical circuits in response to projected patterns of light or heat radiation.

Description: Kodak Ektron detectors are small slips of glass coated with lead sulfide. Applications of cells are numerous. In addition to possibilities for heat detection devices and replacement of regular photo-electric cells in rough service applications, detectors can be used in automatic control of chemical processes. Cells may be used to automatically monitor exact composition of fluids flowing through process stream by measuring characteristic infrared transmittance of various fluids.



Bit of glass ¾-inch long holds 20 sensitive cells. Tiny black specks lying under pencil point are actual cells

Other applications may be in complex electrical equipment where mechanical switches are too bulky or unreliable. Detector permits light beam to eliminate moving part.

(Ektron Detector Cells are a product of Eastman Kodak Company, Dept. CP, 755 Ridge Rd. West, Rochester 13, N.Y. . . . or for more information reader may simply check CP 5048 on form opposite last page.)

Measure dust or smoke load in plant atmosphere with photometer

Uses: Designed for study, measurement, and control of air pollution and particulate matter suspended in aerosols. Instrument has other applications such as control and research tool for filter designing, testing efficiency of exhaust fans or air-wash systems.

Features: Range of concentration observable with instrument is about 100,000 times, sufficient to include all outdoor and most indoor air pollution.

Description: Optical system measures forward scattering of light from particles drawn continuously through darkfield illumination. When composition and particle size of atmospheric contaminant remain constant, reading is directly proportional to mass concentration. Large range is obtained on single scale by logarithmic amplification of photocurrent from photomultiplier tube which is illuminated by forward-scattered light.

Photometer can be remotely located from recorder for control applications

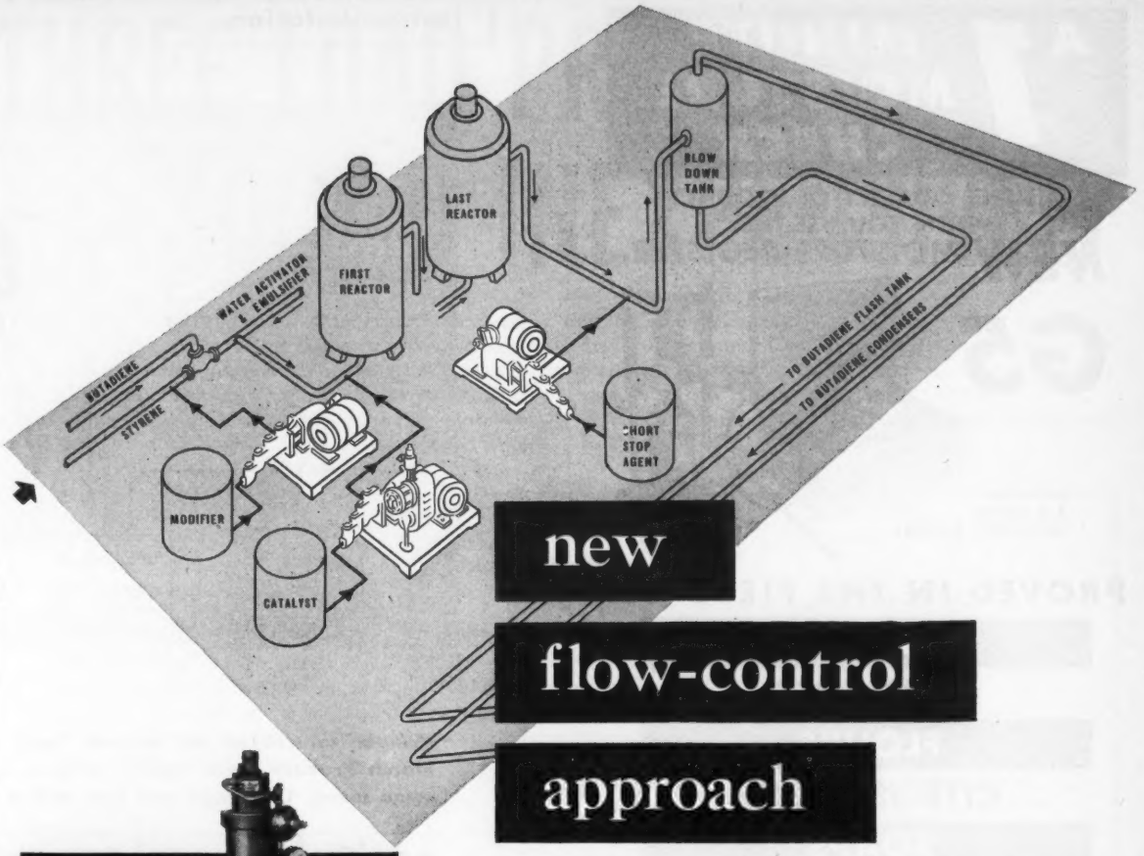
Single and double pen strip chart recorders, linear detector and power supply, spot light galvanometer, and other accessories are available with photometer.

(Forward-scattering photometers are products of Phoenix Precision Instrument Co., Dept. CP, 3803-5 N. 5th St., Philadelphia 40, Pa. Check CP 5049 opposite last page.)

Explains operation and features of proportioning pump

Proportioning pump with no packing, high-speed valves, and pulse-free flow is described and illustrated in two-color, six-page bulletin.

Bul AP-54 is issued by Hills-McCanna Co., Dept. CP, 3025 N. Western Ave., Chicago 18, Ill. Specify CP 5050 opposite last page.



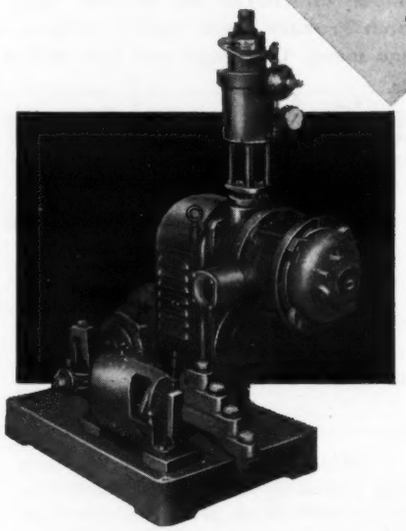
new

flow-control

approach

guards product quality in continuous polymerization

Controlled volume pumps are flow control instruments



Motor-driven controlled volume pump, with air-controlled variable drive, which adjusts pumping speed automatically to control rate of reaction.

PRECISE flow control—accurate metering of catalysts, inhibitors, defoamers, and other additives—largely determines product quality in continuous polymerization of rubber. Milton Roy *controlled volume pumps* have taken over this flow control job with excellent results.—More precise control. No over- or under-treatment. Better product quality. Significant savings on costly additives.

Reason: controlled volume pumps are actually flow control instruments . . . particularly valuable for low capacity flows. They precisely meter process additives—any viscosity liquid or slurry—to an accuracy of within 1%.

Milton Roy offers you long experience in handling low capacity flow control problems . . . in engineering complete chemical feed and automatic control systems. Write for technical information. Or, send your problem to the Milton Roy Company, *Manufacturing Engineers*, 1300 East Mermaid Lane, Phila. 18, Pa.

Engineering representatives in the United States, Canada, Mexico, Europe, Asia, South America, and Africa.

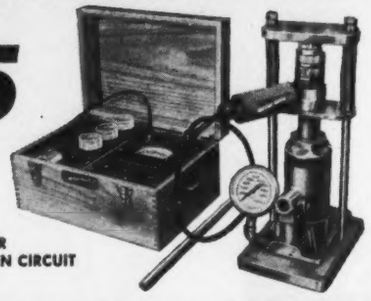
milton Roy
CHEMICAL FEED SYSTEMS

When inquiring check CP 5051 opposite last page

A 1 MINUTE MOISTURE CHECK

INSURES QUALITY OF PRODUCT
WHEN YOU USE THE
NEW MOISTURE REGISTER

G5



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Moisture Register testing equipment is the standard in moisture testing for all industries.

1510 W. Chestnut St., Alhambra, California, Dept. CP

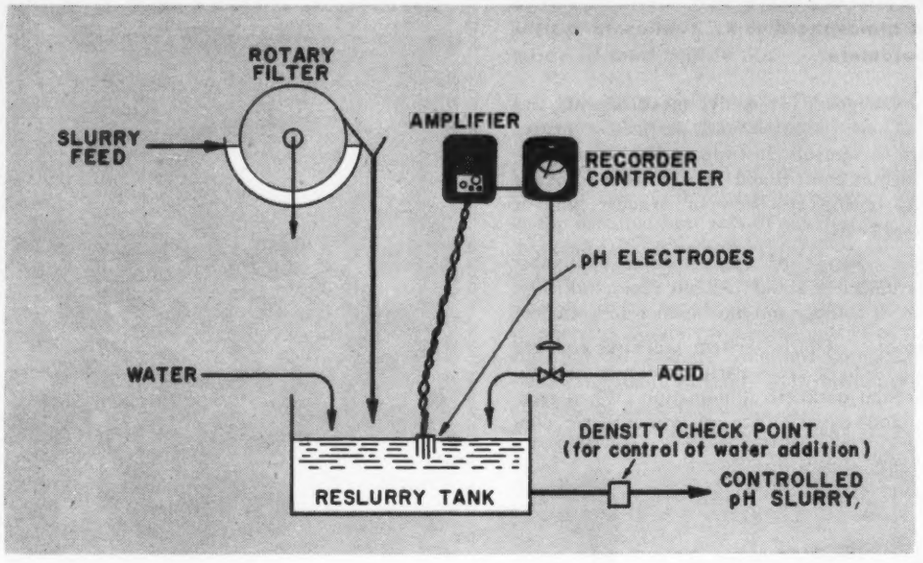
Please send me complete information on MODEL G5 MOISTURE REGISTER. I want to test _____ (MATERIAL)

NAME _____ TITLE _____

COMPANY _____ ADDRESS _____

CITY _____ STATE _____

When inquiring check CP 5052 opposite last page



Manual control of pH worked well at National Starch Products until tighter product specifications came along. Challenge was met with a . . .

switch to automatic pH control

. . . for continuous starch slurry production

By LES MOBERLY, Chemical Engineer
National Starch Products, Inc.
with BRUCE FADER, Associate Editor

Problem: Maintaining proper pH of starch slurry during processing is vital. It influences the viscosity of the final starch product. Until a few years ago this pH factor was under manual control at National Starch Products' Indianapolis plant. But when special starch products with very tight specifications came into production, manual control was no longer good enough.

For example, with manual operation pH spot checks varied between 3.5 and 5.6 when aiming at a pH of 4.8.

Solution: Automatic pH control was the obvious way out of this problem. While some conditions of the process tended to make such control easy, there were some difficulties to overcome in such a system.

On the plus side of the ledger, flow rate of the slurry was steady at about 60 gallons per minute of a reslurried starch to be produced. Reslurrying was done in a 2000 gallon tank — a convenient reservoir for leveling out pH after addition of acid. Cake fed to reslurrying tank from filter ran about 45 to 50% water. Finished pH of the products was in the range between 4.5 and 7.0 pH units. Each product had to be controlled within the specific range established as standard for that particular grade. Principal problems involved behavior of acidulated starch and conditions under which instruments had to operate. Upon standing, starch to which acid had been added drifted toward neutrality. Luckily for engineers on this project, this "regain" was found to be predictable — starch slurry freshly acidulated to pH 5.5 would eventually become stable at pH 6.5; freshly acidulated to pH 6.5, it ultimately would reach pH 7.0.

Operating conditions, however, did foul up in strument operation for a while. Leads from glass electrode-calomel electrode cell to the amplifier were about 30 feet long. Ordinarily this would

Controller and pH ampifier are mounted in one panel. Supervisor is shown here making adjustment

have presented no problem, but moisture from humid atmosphere collected in a junction box in this line. Situation was not helped by extreme cleanliness of the operation which called for frequent washups. Junction box was waterproofed by enclosing in polyethylene plastic film which was taped tight.

In operation electrodes sealed in reslurry tank sense pH, send electrical signal to an amplifier. Amplifier output drives Foxboro recording controller which positions a porcelain acid control valve. Correct amount of sulfuric or hydrochloric acid for proper pH is added to reslurry tank through this valve. Makeup water to reslurry tank is governed by a slurry density measurement in output line.

Results: Satisfactory operation is now accepted as routine performance in pH control. Instrument system consistently holds pH in reslurry tank to within ± 0.1 pH units of set point. This results in a final tolerance (after "regain") of ±0.2 pH units.

Maintenance is routine. Only regular service is to wash pH electrodes between runs. This is a once-a-day job.

(pH measuring equipment was supplied by Beckman Instruments, Inc., Dept. CP, 2500 Fullerton Rd., Fullerton, Calif. . . . or for additional information reader may simply check CP 5053 on the convenient Reader Service slip which is located opposite last page.)

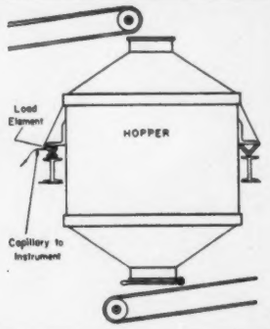
THREE LOAD PROBLEMS SOLVED INEXPENSIVELY

TAYLOR Volumetric Load Measuring Elements are the practical answer to applications throughout industry where reliable accuracy at low cost is more important than microscopic precision. Rugged, dependable, unaffected by dirt or dust, they require the very minimum of maintenance. And while conventional methods of weighing have an initially higher order of accuracy, they may quickly deteriorate. In the long run therefore Taylor Volumetric Load Elements are more accurate—at a fraction of the cost of conventional instruments.
Write for **Bulletin 98232.** Taylor Instrument Companies, Rochester, N.Y., or Toronto, Canada.

Problem: To measure dependably and economically the weight of solids in a measuring hopper.

Solution: Taylor Spool Type Load Measuring Element.

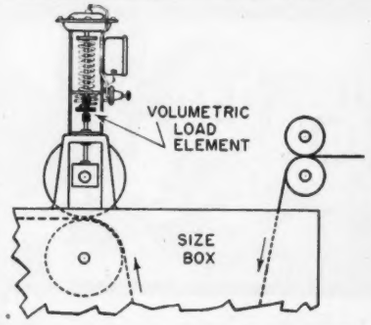
Characteristics: Range limits, 0-240,000 lbs. for compression loads, maximum load not to exceed 400,000 lbs. Applicable also to horizontal or vertical tanks containing corrosives or solids, making conventional level measuring devices impractical. Tension loads 0-30,000 lbs.



Problem: To measure accurately squeeze roll pressures on textile slashers to insure uniform penetration of size.

Solution: Diaphragm type load Measuring Element.

Characteristics: Range limits: 0-5,000 lbs., maximum load not to exceed 6,250 lbs. Compound ranges, tension –0– compression also available. Applicable to measure roll or nip pressures in calender stacks, press section and many other finishing operations involving processing of material between rolls.

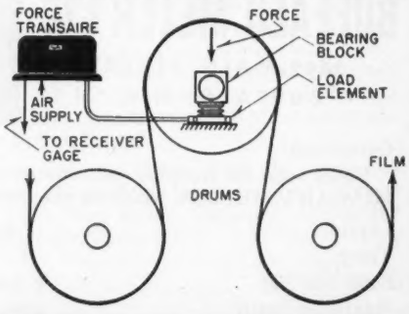


Problem: To measure film tension within very close limits as a measure of "gain" or percentage of stretch.

Solution: TRANSAIRE* Volumetric Load Measuring Element.

Characteristics: Range limits: 0-300 lbs. in range spans as short as 30 lbs. Used in conjunction with a TRANSAIRE Pressure Transmitter which sends an output air pressure to an indicating, recording, or controlling receiver proportional to the force applied. Applicable to film, paper, yarn or similar tension measuring requirements.

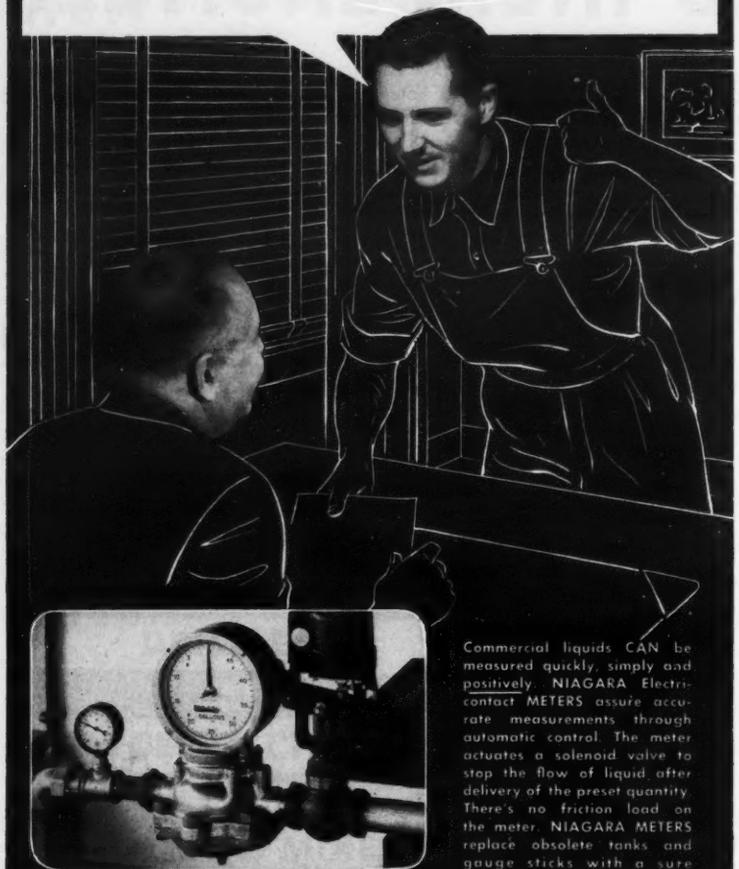
*Reg. U.S. Pat. Off.



Taylor Instruments **MEAN ACCURACY FIRST**

When inquiring check CP 5054 opposite last page

"I save time and get better accuracy in our liquid measurements with NIAGARA Electricontact METERS"



Commercial liquids CAN be measured quickly, simply and positively. NIAGARA Electricontact METERS assure accurate measurements through automatic control. The meter actuates a solenoid valve to stop the flow of liquid after delivery of the preset quantity. There's no friction load on the meter. NIAGARA METERS replace obsolete tanks and gauge sticks with a sure method of precise measurement.

Find out just how NIAGARA Electricontact METERS can give you the most accurate batch measurements—automatically.

Send in the Data Request blank below . . . today.

BUFFALO METER CO.

2892 MAIN STREET
BUFFALO, N.Y.

Gentlemen:

Please send me complete information on the use of economical NIAGARA METERS, based on the data below:

Liquid ..... **Pressure** ..... **p.s.i.**
Temp. ..... **° F.**
Flow rate ..... **g.p.m.**
Maximum batch ..... **gals.**
Name .....
Company .....
Address .....

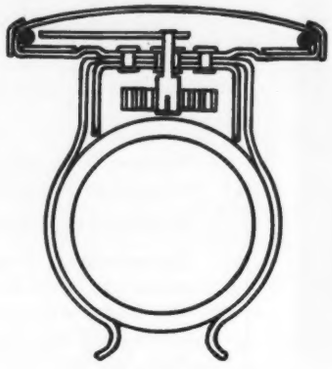
When inquiring check CP 5055 opposite last page

INSTRUMENTATION

Clip-on thermometer checks temperature of pipe surface . . .

unit fits pipes from ½ to 2", can be installed without tools

Thermometers, quickly fastened to pipe by means of spring clips, measure pipe-surface temperatures in two ranges: —50 to 250°F or 70 to 370°F. Temperature sensitive element is bimetal with accuracy of ±2° over entire range. Bimetal element is protected by copper cup which fits pipe closely. Instrument fits pipes or tubes from ½ to 2" OD. Thermometer dial is 2" in diameter.



(Pipe surface thermometers are a product of Pacific Transducer Corp., Dept. CP, 11836 West Pico Blvd., Los Angeles 64, Calif. . . . or for more information concerning manufacturer's product, check CP 5056 on handy form which is located opposite last page.)

Uses gamma rays to measure product density in tanks or pipelines . . .

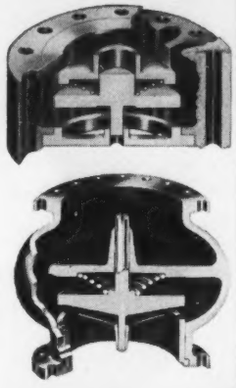
density readings made without contact with fluid; prevents fouling or corrosion

Uses: For measuring density of products ranging from water solutions to heavy tars and ore suspensions. Instrument also works on fluidized solids such as grain, powdered coal, and wood chips.

Features: Density is measured without any contact with fluid. Measuring head cannot gum up or foul. Gamma rays measure through walls of process vessels and pipes. Liquids under pressure or sealed in sterile conditions can also be metered.

Description: Unit consists of gamma ray source (Cobalt 60) and gamma ray detector. Radiation source is capsuled in aluminum to prevent con-

For all Piping systems handling . . .



WATER
OIL
GAS
ACIDS
ALKALIES
and other fluids

WILLIAMS-HAGER
FLANGED
Silent
CHECK VALVES

Send coupon today for your copy of Bulletin 654! This bulletin gives complete details on these dependable Williams-Hager check valves and how they eliminate water hammer and other costly and annoying noises in all types of piping systems. Available in sizes for every service. Renewable working parts. Write today.

THE WILLIAMS GAUGE CO., INC. (854CP)
146 Stanwix St., 2 Gateway Center
Pittsburgh 22, Pa.

Please send me a copy of Bulletin 654 on Williams-Hager Flanged Silent Check Valves.

NAME _____
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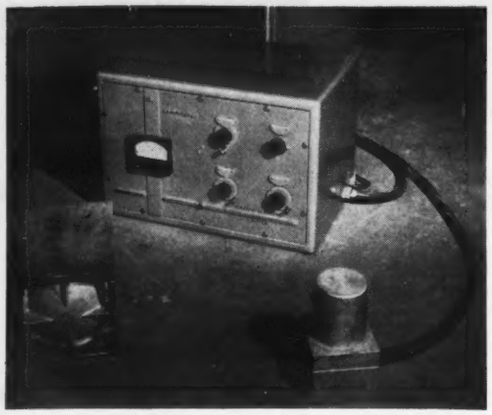
COMPANY _____
ADDRESS _____
ZONE ____ STATE ____

CHECK VALVES
THE WILLIAMS GAUGE CO., INC
146 Stanwix St., 2 Gateway Center
Pittsburgh 22, Pa.

When inquiring check CP 5057 opposite last page



Uses Cobalt 60 gamma ray source and pressurized argon ion chamber

tamination and shielded in 150-lb lead block. Detector unit is ion chamber, filled with 200 psi argon. Source and detector are explosion-proof.

Cobalt 60 source emits gamma rays into substance to be measured. Nature and quantity of material determines what percentage of gamma rays are absorbed on their way to detector; hence signal is generated in detector and fed to amplifier. Before entering amplifier, however, signal is balanced against second signal from another source and detector combination permanently associated with amplifier. This second signal, having been adjusted to desired balancing value, is then constant reference. Difference signal which is fed into amplifier is measure of variation in measuring signal. Difference signal, after amplification, can be applied either to meter or chart recorder.

Gage is set up as follows:

1) gage is balanced to give center scale reading for mid-point of density range involved

2) meter sensitivity is adjusted to cover desired range of densities on scale.

Accuracies of better than 0.1% have been achieved by Gammagage. Gage is undergoing extensive trials in diversified group of industries. It has functioned satisfactorily in such operations as rubber vulcanization, and feed to ore concentrators.

(Gammagage is a product of Instrument Div., Isotope Products, Inc., Dept. CP, 1700 Niagara St., Buffalo, N.Y. . . . or for more information check CP 5058 on handy form opposite last page.)

How much starch is needed to thicken?
Quick answers with nomograph, page 208

No maintenance problems with this instrument!

In spite of all of the development work being done on automatic control instruments, the Bristol Series 500 Air-Operated Controller is still the most dependable and trouble-free — as proved by thousands of installations. And here's why:

It's the simplest to service. Only one adjustment with a ¼ in. wrench calibrates the control system. No other adjustment is needed. Control system can be completely disassembled and, after reassembly (even with replacement parts), can be *exactly calibrated by this one simple adjustment.*

It's completely reliable. One user states, "I'm amazed at the way this instrument performs day-in and day-out with little or no attention. We call it the workhorse controller in our plant. And our plant men like to use it, because it gives them the precision results they need without having to fuss with it".

Its settings are exactly reproducible. Reset rate, derivative time, and proportional band adjustments are accurately calibrated and exactly reproducible. You can instantly reproduce established settings without cut and try.

It uses the world-famous Bristol measuring elements. The measuring systems used in Bristol Series 500 Air-Operated Controllers for TEMPERATURE, PRESSURE, FLOW, VACUUM, DRAFT, ABSOLUTE PRESSURE, LIQUID LEVEL, pH, AND HUMIDITY are the result of 65 years of experience in instrument making and application in practically every industry. Bristol measuring elements are recognized the world over for their accuracy, simplicity, and reliability. There just aren't any better measuring elements made than Bristol's.

For more facts and figures about the Series 500 Air-Operated Controllers, write for free 32-page bulletin A120. The Bristol Company, 141 Bristol Road, Waterbury, Connecticut. 4.27

BRISTOL'S

BRISTOL *POINTS THE WAY IN HUMAN-ENGINEERED INSTRUMENTATION*

AUTOMATIC CONTROLLING, RECORDING AND TELEMETERING INSTRUMENTS

When inquiring check CP 5059 opposite last page

BARBER COLMAN

NEW Wheelco Model 405 Capacitrol

Exclusive Wheelco development improves and simplifies proportioning control!

Now you can reduce equipment costs and save on maintenance! Wheelco brings you a new . . . exclusive . . . simplified . . . completely nonmechanical proportioning control form for fuel-fired heat processing applications.

The "heart" of the "Model 405" is the extremely sensitive and stable "Micropositioner" . . . a new polarized relay that serves to position control valve actuators. It is driven directly by the output of the controller's electronic circuit — maintaining *true* proportioning control without complex equipment.

Other advantages of the Model 405 Capacitrol include manual "droop" correction and proportioning band adjustment; thermocouple break protection; full "plug-in" construction; and many advance-design features never before combined in one, low-cost instrument. Write for Bulletin F-6493.

WHEELCO INSTRUMENTS DIVISION

BARBER-COLMAN COMPANY, DEPT. N, 1520 ROCK STREET, ROCKFORD, ILLINOIS
BARBER-COLMAN OF CANADA, LTD. • TORONTO, ONTARIO, CANADA

Industrial Instruments • Automatic Controls • Air Distribution Products • Aircraft Controls • Small Motors
Overdoors and Operators • Molded Products • Metal Cutting Tools • Machine Tools • Textile Machinery

When inquiring check CP 5060 opposite last page

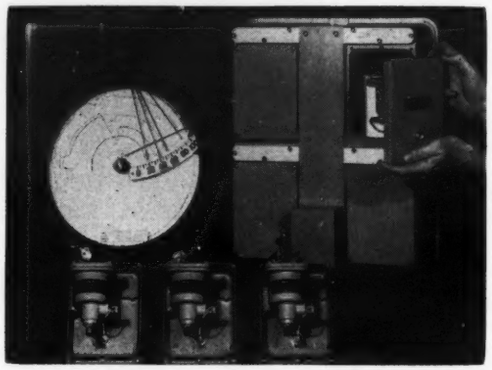
Continuously records 1 to 4 signals from pneumatic or electric primary sources . . .

fountain-type recording pen holds ink supply for one year without refilling

Uses: For recording any measured variable which may be converted to pneumatic or electric signals.

Features: Recorder keeps continuous, independent records of one to four pneumatic or electric transmissions in any combination. Fountain-type recording pens provide continuous feed for one year without refilling.

Description: Receiver units may be added or interchanged, permitting easy field adaptation to new or revised metering and control applications. Recorder uses plug-in, precalibrated receivers. Two plug-in escapement-type integrators may be used with two flow recorders. Recorder is designed for panel mounting, requiring cutout of 14 x 17". No panel bolt holes or studs are required. Recorders are available in green, buff, grey, or black baked enamel finish.



Receiver units may be plugged into rear of recorder to form any combination of one to four records

(Recorders are a product of Bailey Meter Co., Dept. CP, 1050 Ivanhoe Rd., Cleveland, Ohio . . . or for more information check CP 5061 on handy form opposite last page.)

Uses bonded strain gage to measure, transmit pressure . . .

instrument is housed in stainless steel pressure chamber designed to resist corrosion

Uses: For measuring and transmitting pressure in hard-service applications such as high pressure pipe lines and hydraulic systems.

DAVIS

a complete line of

GAS ANALYSIS SYSTEMS

operating by catalytic combustion, electro-conductivity, thermal conductivity, and photochemical reactions.

Continuous ELECTRO-CONDUCTIVITY GAS ANALYZER

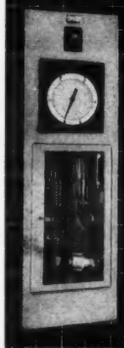
For the analysis of gases and vapors that ionize in water, directly or when decomposed by heat. Sensitive to small quantities.

Send for Bulletin 11-70

Continuous COMBUSTIBLE GAS ALARM SYSTEMS

For the protection of life, property and processes against combustible gases and vapors in air. Gives audible and visual alarm signals.

Send for Bulletin 11-36



PHOTOCHEMICAL OXYGEN ANALYZER

Continuous measurement of oxygen in gaseous streams, 0-100 p.p.m. Outstanding for simplicity of operation, specific measurement of oxygen without interference from most other gases.

Send for Bulletin 11-40

INSTRUMENT DAVIS DIVISION

DAVIS INSTRUMENTS
56 Halleck St., Newark 4, N. J.
Progressive Manufacturers of Gas Analysis Instruments

When inquiring check CP 5062 opposite last page

Features: Mechanical natural frequency exceeds 2000 cps for 1000 psi range. Bonded strain gage will take rough handling — insensitive to accelerations in two horizontal planes and vertically less than 6.3% of full scale per G.

Description: Sensing element consists of precision metal ring, acting as elastic member, to which four electrical resistance strain gages (arranged in bridged circuit) are bonded. Two gages are bonded to internal surface of ring; other two

Signal from pressure transmitter is fed to self-balancing potentiometer recorder

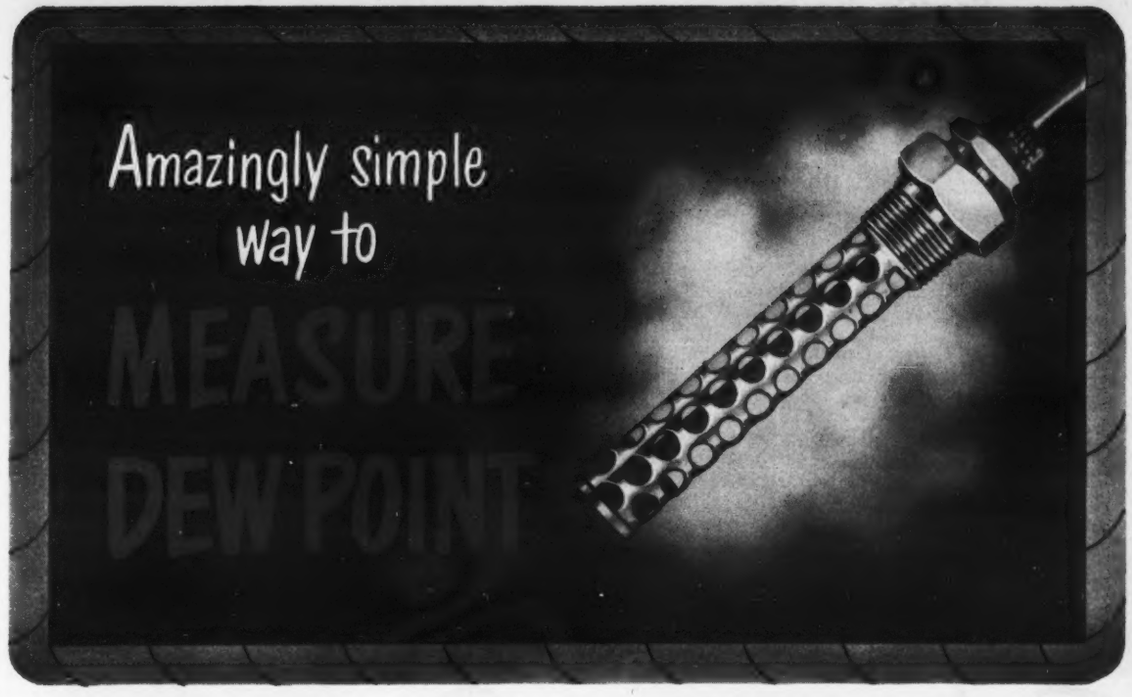
are bonded to external surface and are in tension. Electrical unbalance produced as result of increasing pressure is proportional to pressure increase. Signal is fed to self-balancing potentiometer recorder. Bridged circuit is compensated for changes in sensitivity with temperature variations.

(Teledyne pressure transmitters are products of Taber Instrument Co., Section 46, Dept. CP, 111 N. Goundry St., N. Tonawanda, N.Y. . . . or for more information reader may simply check CP 5063 opposite last page.)

Discusses controls and regulators for "automated" systems

Adjustable-speed drives, electronic controls and regulators, and motor drive control and regulation is explained in 12-page booklet. Final section of publication includes captioned photographs which graphically illustrate automation at work in many industries.

"Tools of Automation" is issued by Reliance Electric & Engineering Co., Dept. CP, 1088 Ivanhoe Rd., Cleveland 10, Ohio. When inquiring specify CP 5064 on convenient form opposite last page.



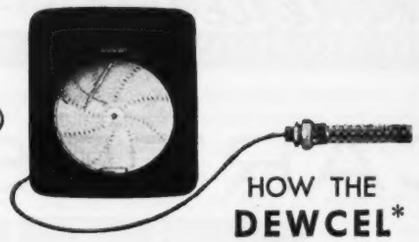
directly . . . accurately . . . continuously

Now you can measure or control the humidity content of air or process gases with simplicity and accuracy never before obtainable!

An entirely new-type humidity-sensitive element, the exclusive Foxboro Dewcel*, opens many new possibilities for product improvement in industry. Coupled with a Foxboro Recorder or Controller, the Dewcel offers these outstanding advantages:

1. Direct recording in dew point temperature, at existing pressure.
2. Wide working range — even operates at sub-zero temperatures.
3. Neither adds nor removes water from atmosphere.
4. No water box or circulation of air required.
5. Simplicity that eliminates maintenance.
6. Sustained accuracy within 1°F. to 2°F.
7. Initial and operating economy.

Investigate Foxboro Dew Point Control for your process. In successful use in nuclear fission, pharmaceutical, food and chemical plants, distilleries, photo film production, drying and storage operations. Write for Bulletin 407. **The Foxboro Company, 812 Neponset Ave., Foxboro, Mass., U.S.A.**



HOW THE DEWCEL* WORKS

The Dewcel element is a thermometer bulb (liquid-filled or electric-resistance type) jacketed with lithium-chloride-impregnated woven glass tape. Over this are wound two spaced wires connected to an AC source. The lithium chloride absorbs moisture, allowing current to flow, generating heat, and raising the temperature. Equilibrium temperature is reached when vapor-pressure of the moist salt exactly balances that of the surrounding air or gas. The System translates this temperature into direct readings of dew point.

Thus, Foxboro Dew Point Instruments give direct readings or control of dew point from —50°F. to 142°F. at working temperatures from —40°F. to 220°F. Readings easily converted to absolute or relative humidity.

*Trade Mark

FOXBORO INSTRUMENTS

FACTORIES IN THE UNITED STATES CANADA, AND ENGLAND

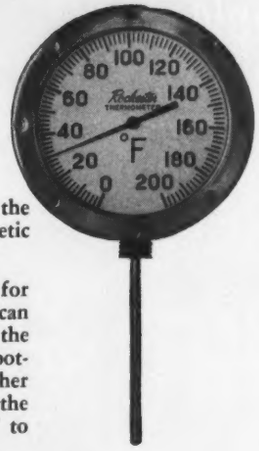
When inquiring check CP 5065 opposite last page

• **Readily Visible**

• **Adjustable Dial Position**

• **Submersible**

The RIGHT thermometer for your requirements



Shockproof accuracy — easily maintained with a simple external screw adjustment — another Rochester first.

All stainless steel construction including the weld, offers more corrosion resistance. Hermetic sealing protects dials from fogging.

Rochester Model No. 1850 is recommended for use wherever a straight form thermometer can be used to an advantage. Model 1850 in the standard form has the stem located at the bottom. The stem can also be located at any other position around the entire periphery of the head. Available in stem lengths from 2½" to 48".

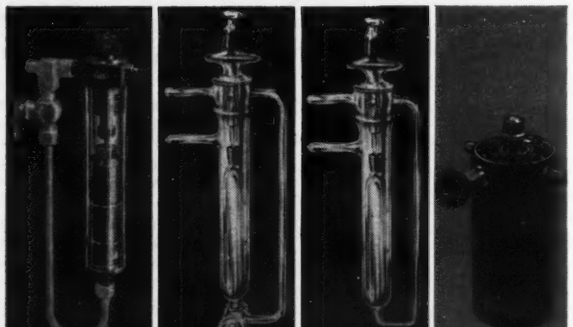
For further information on this straight form or other type thermometers — write

Rochester Manufacturing Company, Inc.
86 Rockwood St., Rochester 10, N. Y.
ROCHESTER DIMENSIONAL ACCURACY GAUGES
DIAL THERMOMETERS GAUGES AMMETERS

When inquiring check CP 5066 opposite last page

CARTESIAN

for automatic vacuum and pressure control



MANOSTATS

They remember your vacuum setting even after shutting down system! Exclusive with Emil Greiner! No other instruments in the field can compare with these remarkable Cartesian Manostats for sensitivity, accuracy and reliability. Designed on the simple phenomenon of the Cartesian Diver, their construction, installation and operation is uncomplicated and dependable.

For complete information, write for Constant Pressure and Vacuum Control Bulletin.

The EMIL GREINER Co.
20-26 N. MOORE STREET DEPT. 224, N. Y. 13, N. Y.

The Emil Greiner Co., Dept. 224,
20-26 N. Moore Street, New York 13, N. Y.
Please send me Cartesian Manostat Bulletin.

NAME_____
COMPANY_____
ADDRESS_____
CITY_____ ZONE____ STATE_____

When inquiring check CP 5067 opposite last page

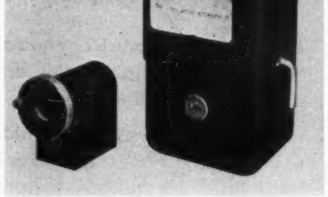
Measures, controls temps in 1000-5000°F range . . .

unit consists of phototube, amplifier, relay, and meter

Uses: For measuring temperature of objects that are moving or surrounded by induction heating coils.

Features: Photoelectric pyrometer has temperature measuring and control range of 1000 to 5000°F and sensitivity of one footcandle full scale.

Description: System consists of two units: scanner (phototube, lens assembly with variable iris) and controller (electronic amplifier, relay, and meter). As temperature of hot object being scanned rises, increase in radiation is indicated on meter which can be calibrated in degrees. Heavy duty control relay can be set to operate at any temperature within range of set. Sensitivity adjustment allows relay trip point to be pre-set, providing automatic control of signal devices or heat input.

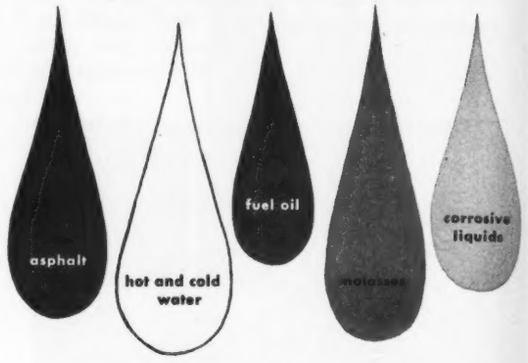


Components plug in to control chassis to facilitate simplified replacement

Relay is SPDT rated at 10 amp @ 115v or 5 amp @ 230v, noninductive. Power consumption is 12w @ 115 or 230v, 50/60 cy.

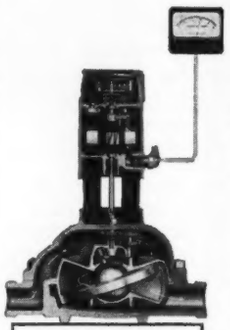
(Photoswitch pyrometer is a product of Photoswitch Div., Electronics Corporation of America, Dept. P106, Dept. CP, 77 Broadway, Cambridge 42, Mass. . . . or for more information about manufacturer's product reader may simply check CP 5068 on handy Reader Service slip which is located opposite last page.)

viscosities unlimited



HAYS VERIFLOW METER AND HAYS ELECTRONIC VERITROL indicate and control liquid flow

Now virtually all fluids can be precisely measured and accurately controlled—*from a remote position.*



Hays VERIFLOW meter accurately measures, indicates, and totals the flow of corrosive and hard-to-meter liquids without using weigh tanks, orifice plates, or gage sticks.

With the Hays VERITROL you simply set a knob at the rate of flow desired . . . then, the VERITROL controls the flow of liquid at that set-rate.

Send for Pub. No. 53-766-38.

for corrosive liquids

Acetic Acid, Aluminum Potassium Sulphate, Ammonia, Calcium Compounds, Carbolic Acid, Formaldehyde, Fruit and Vegetable Juices, Hydrogen Peroxide, Phosphoric Acid, Potassium Hydroxide, Sodium Compounds, Sulphuric Acid (concentrated), Stearic Acid, and many others.

Automatic Combustion Control
Boiler Panels • Hays-Penn Flowmeters
Veriflow Meters and Veritrol
Gas Analyzers • Draft Gages
Combustion Test Sets • CO_2 Recorders
Electronic Oxygen Recorders
Electronic Flowmeters
Electronic Feed Water Controls
Miniature Remote Indicators

THE **hays** CORPORATION
MICHIGAN CITY 12 INDIANA

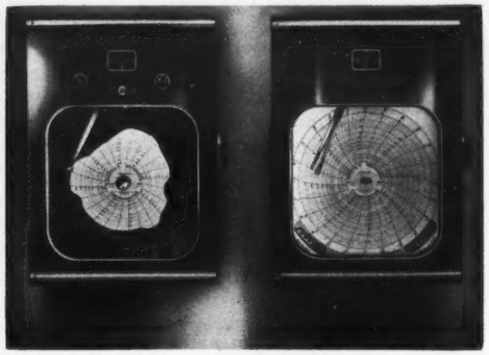
When inquiring check CP 5069 opposite last page

Wide-strip chart recorder measures amps, volts simultaneously

Uses: For measuring and recording current and voltage simultaneously on one chart.

Features: Potentiometer has fast response time (1½ sec for full scale travel) and accuracy to within 1% and sensitivity of 0.05 of 1%.

Description: Primary measuring elements of one-case instrument are a thermal-voltage converter and thermal-current converter, AC/DC



Half the chart is used for recording amperes, the other half for volts

transducers. Chart is divided into two zones —— one half of chart is for recording amperes, the other for volts. Chart speeds from ¾" per hour to 4" per second are available.

Because of high torque output of recorder, auxiliary functions (high alarm contacts, retransmitting slidewires, etc.) can be added to instrument without affecting accuracy or sensitivity. Combination of thermal converters and recorder also provides basic voltage telemetering system which can transmit for considerable distance without additional internal or external equipment.

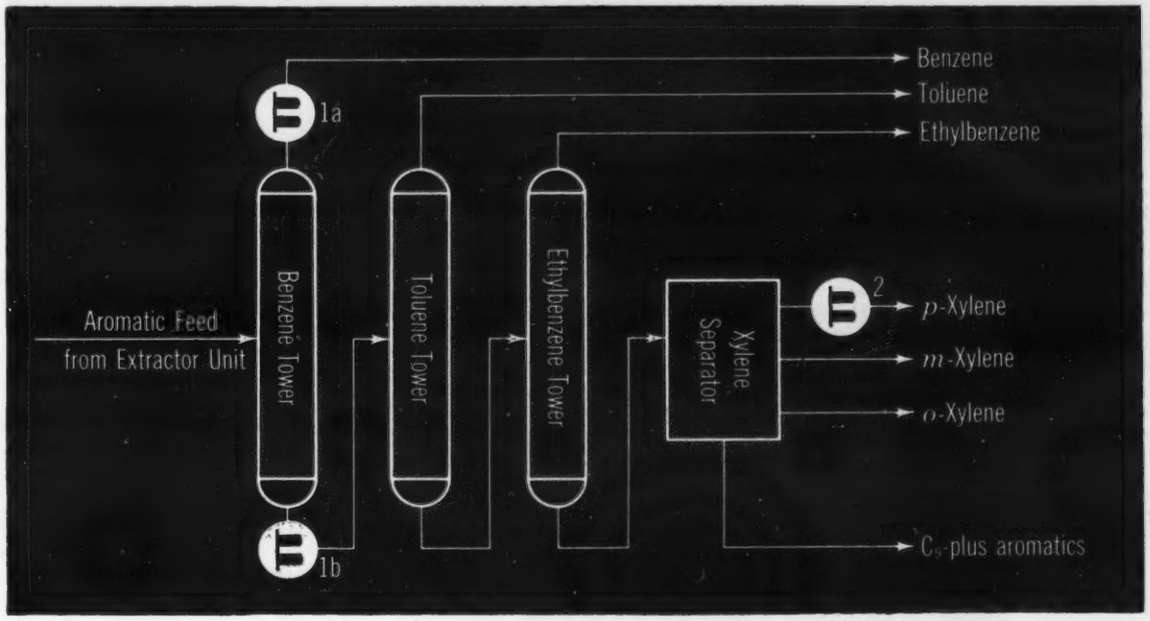
(Dyanamaster Ammeter-Voltmeter is a product of Bristol Co., Dept. CP, 143 Bristol Rd., Waterbury 20, Conn. . . . or check CP 5070 opposite last page.)

Analytical and control instruments described in 12-page bulletin

Graphically-illustrated general catalog contains information on manufacturer's analytical, isotope-ratio, dual purpose and process-monitoring mass spectrometers; high-vacuum leak detectors, sulfur recorders, and analog-to-digital converters.

Bul CEC-1302A is issued by Consolidated Engineering Corp., Dept. CP, 300 N. Sierra Madre Villa, Pasadena, Calif. When inquiring specify CP 5071 on handy form opposite last page.

TRUE CONTROL BEGINS WITH ANALYSIS...



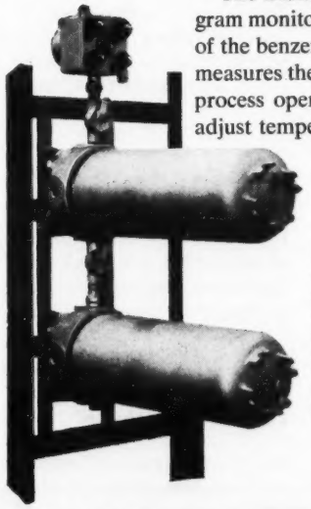
Aromatic recovery increased with BICHROMATOR* Analyzer

In many continuous fractionation operations, such as the aromatic separation shown above, product purity versus percent recovery determines over-all operating profit. Continuous analytical control of the fractionation tower *results in an increase in recovery while maintaining product purity.* Such an increase is possible because a continuous knowledge of stream composition insures optimum setting of the process variables at all times.

The Bichromator Analyzer (1a) in the diagram monitors benzene purity in the overhead of the benzene tower while Bichromator (1b) measures the benzene loss in the bottoms. The process operator uses this analytical data to adjust temperature and flowrate in the tower so that the benzene loss in the bottoms is held to a minimum consistent with the overhead product purity. In a plant with a 300 barrel per day benzene capacity, a two percent average increase in recovery pays out the analyzers in less than six months.

Similar increases in product yield can be realized through the installation of Bichromators on the other towers—of particular importance is the continuous analysis of *p*-Xylene purity (2) where this is being separated from the other xylenes.

Perkin-Elmer engineers will be glad to show you how you may apply modern methods of analytical control to your process to increase operating profit. The return of the coupon below will receive our prompt attention.



Both the TRI-NON *and* BICHROMATOR Analyzer *continuously record the concentration of any desired stream component. Each is sensitized and adjusted to specific plant conditions before shipping.*

*Trade-Mark—Perkin-Elmer

THE PERKIN-ELMER CORPORATION
870 Main Avenue, Norwalk, Conn.

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.....

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Steam-Jacketed
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The EVERLASTING Steam-Jacketed Valve has proven outstandingly successful in handling many different kinds of viscous materials, such as tar, asphalt, pitch, paraffin, waxes, molten sulfur, etc.

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briefs

from contemporary publications

Control of corrosion

Solutions for corrosion problems in industrial and steam power plants are suggested, and the applicability and limitations of preventive equipment are analyzed. Seven pages. (*"Combustion", October* 1954, *page* 38.)

Sodium

Sodium is used in reduction and descaling of metals. Its alloys can be used as heat transfer media, drying agents, and in controlling additions to other metals. Three pages, 3 tables, 2 figures, 8 references. (*"Chemical Engineering Progress," September,* 1954, *page* 457.)

Guarding machines

Twenty-five parts that are common to many machines are listed as definitely dangerous. Guarding and safety education are discussed, and the fallacy of "inaccessibility" is exposed. (*"Safety Maintenance and Production," September,* 1954, *page* 16.)

Rinse tanks

In connection with electroplating, the design of counterflow rinse tanks is illustrated, and fundamental equations are given. Six pages. (*"Metal Finishing," October* 1954, *page* 56.)

Ethylene to ethanol

For the hydration of ethylene to ethanol, reactions, description of process, and specifications of product are given. Six pages, 11 figures. (*"Chemical Engineering Progress," October* 1954, *page* 526.)

Literature searches

This system for searching the literature deals with author's name methods, subject heading methods, literature of background sciences, and with industrial, patent, and market literatures. The use of various established abstracts is covered. Three pages, 3 references. (*"Tappi" September,* 1954, *page* 193*A*.)

Review of materials of construction

This survey of materials of construction for chemical engineering covers aluminum alloys, cements, ceramics, copper, elastomers, fibers, steel, lead, paint, rubber, tin, wood, and plastics, and is copiously documented with organized literature references. One hundred and two pages. (*"Industrial and Engineering Chemistry," October* 1954, *page* 2041.)

Formation of knots

A study of the formation of knots in groundwood, sulfite, and kraft pulps shows that Rotapulpers, which cause knots at high consistencies, remove knots efficiently at low consistencies. Four pages, 3 tables, 4 figures. (*"Paper Industry," October* 1954, *p.* 707.)

Aluminum coating

The physical properties of aluminum hard coatings are presented in tabular and graphical forms and are accompanied by discussion. For aluminum coatings, hardness and resistance to wear influence design and application. Six pages, 8 tables, 5 figures. (*"Product Engineering," September,* 1954, *page* 136.)

abstracts of pertinent articles in other industrial publications . . . selected by CP editors as a service for you . . .

Atmospheric dirt

Samples of atmospheric dirt collected over 30 American cities vary widely in content of carbon, silica, and mixed oxides. Local variations are related to terrain and economic level. Four pages, one table, 7 figures. (*"Heating, Piping, and Air Conditioning," October* 1954, *page* 145.)

Industrial floors

Procedures for installing industrial floors made of concrete, resilient materials, metals, quarry tile, brick, oxychloride, wood blocks, mastic, and hardwood, to avoid various troubles, are given in guide form. Ten pages. (*"Factory," October* 1954, *page* 114.)

Survey of silicones

Applications of silicones in rubber, foam, laminates, dielectrics, protective coatings, oils, greases, and adhesives are discussed and attention is accorded physical properties. Fourteen pages, 5 tables, 7 figures, 18 photographs. (*"Machine Design," September,* 1954, *page* 176.)

Neoprene hose for gasoline

Simulated service tests show that neoprene hose is satisfactory for transporting gasoline with aromatic content below 40 per cent. (*"Rubber Age," October* 1954, *page* 77.)

How to clean pipe lines

Case histories show how industrial piping can be cleaned and kept at maximum efficiency. Mechanical and chemical means are employed. Five pages, 6 figures. (*"Plant Engineering," October* 1954, *page* 92.)

Heat treatment of steel

An account of austempering and martempering of carbon and alloy steels to attain production advantages includes discussion of pertinent equipment. Four pages, one table. (*"Iron Age," October* 28, 1954, *page* 99.)

Detergent action

The action of whiteness-retention additives in decreasing redeposition of soil during the laundering of textiles is reported. Methods of sedimentation, electrophoresis, and adsorption analysis are employed. (*"Textile Research Journal," October* 1954, *page* 881.)

Preparation of estimates

By means of a plot plan, typical data sheets, and a rough layout, a consulting engineer shows how to make preliminary cost estimates for a proposed chemical processing plant. Five pages, 3 tables, 2 figures. (*"Consulting Engineer," October* 1954, *page* 42.)

Tubing for air service

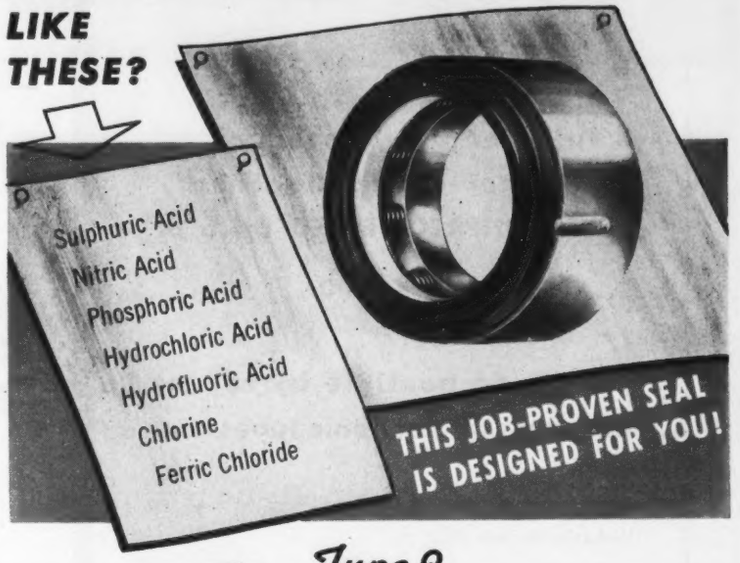
This discussion of the use of plastic tubes in instruments where air lines are employed covers cost analyses, fire resistance, and speed of response. Comparisons with metal tubing are included. (*"Instruments and Automation," October,* 1954, *page* 1614.)

Textile fibers

Carding is considered in connection with the blending of wool with textile fibers. Cleanliness, rate of production, and selection of fibers are discussed. Three pages. (*"Textile Recorder," October* 1954, *page* 74.)

(*Continued on next page*)

HANDLING CORROSIVES LIKE THESE?



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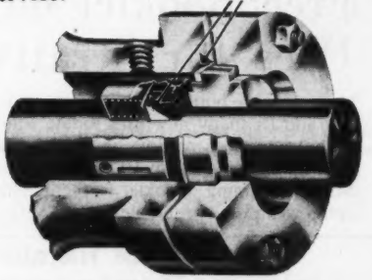
Type 9
MECHANICAL SEAL

Performance records plainly prove that this "John Crane" development has successfully solved the handling of the most difficult corrosive liquids and gases. Where conventional type seals had failed, the Type 9 has done the job. It continues to answer new problems, including temperature conditions from —120°F. up to 500°F.

Designed to withstand practically all chemicals, the Type 9 incorporates a flexible wedge ring and sealing ring molded from DuPont's Teflon. It is engineered for the particular application and can be furnished in the metallurgical specification best suited to the service.



Your toughest problem can be the Type 9's next success story. Use it on all rotating shaft applications, including: centrifugal, rotary pumps, mixers, agitators, autoclaves, other equipment.

Get complete information on the Type 9 Seal from Crane Packing Co., 1821 Cuyler Ave., Chicago 13, Ill.

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JOHN CRANE CRANE PACKING COMPANY

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BRIEFS

(*Continued from preceding page*)

Alumina

The use of sintered alumina, to supplement the usual carbides as a cutting material, is covered in a British paper. Alumina offers excellent strength and resistance to abrasion. Five pages, one table, one figure, 7 references. (*"Research," October* '54, *p.* 379.)

Commercial insulations

A study of the thermal conductivities of commercial insulations at low temperatures is reported. Rigid, felt, and loose fill insulations were investigated at −200°F. Three pages, one table, 7 figures, 9 references. (*"Refrigerating Engineering," September,* 1954, *page* 35.)

Production of sulfur dioxide

From England comes a description of a fluidized process for producing sulfur dioxide from pyrrhotite (Fe_7S_8) as carried out in an American plant. Control of operation and the economics of the process are discussed. Three pages, 3 figures. (*"Industrial Chemist," September* 1954, *page* 424.)

Calcium sulfonate as a rust inhibitor

Through use of radiocalcium as the tagged atom, the absorption characteristics of calcium dinonyl naphthalene sulfonate, a rust inhibitor, were studied. Six pages, 8 tables, 2 figures, 16 references. (*"Corrosion," October* 1954, *page* 343.)

Weather aging of plastics

For the weather aging of styrene and phenolic plastics, panels, distortion, erosion, evaporation, strength, changes in weight, and water absorption are considered. Five pages, 3 tables, 5 figures. (*"Mechanical Engineering," October* 1954, *page* 803.)

How to stop petty theft in industry

Crime commissions and insurance companies make suggestions for minimizing theft in any plant. These include improved security measures, better inventory systems, closer control, and the use of locks. (*"Factory," September,* 1954, *page* 84.)

Viscosity of gases

Viscosities of hydrocarbon gases are correlated with pressure, temperature, and gravity. Viscosities of dense liquid phases can also be predicted. Nine pages, 2 tables, 11 figures, 30 references. (*"Journal of Petroleum Technology," October* 1954, *page* 47.)

Purification of water

Demineralization of water for power and process purposes is covered under the headings of principles, types, degasification, equipment, back washing, regeneration, anion exchangers and cation exchangers. Sixteen pages, 2 tables, 16 figures, 84 references. (*"Industry and Power," October* '54, *p.* 57.)

Sea water for cooling

In considering sea water as an industrial coolant, one should take account of corrosion, bacterial action, marine fouling organisms, galvanic effects, and attack through cavitation and impingement. Four pages, 5 tables, 3 figures, 19 references. (*"Petroleum Refiner," October* 1954, *page* 127.)

Microviscometer

The ball-and-cup viscometer enables rapid determination of the viscosity of oils from bearing greases. Samples as small as 0.035 ml are employed. Five pages, 2 tables, 7 figures, 8 references. (*"Analytical Chemistry," October* 1954, *page* 1609.)

Peroxide bleaching of alkaline pulps

The use of hydrogen peroxide in the final stage in bleaching soda and kraft pulps is covered. Attention is given to moderate-density bleaching. Seven pages, 7 figures, 7 tables. (*"Pulp and Paper Magazine of Canada," July* 1954, *page* 109.)

Determination of Na and K in coal ash

A rapid spectrographic method for determining sodium and potassium in coal ash, tapped slag, fly ash, and tube deposits is described. Three pages, 3 figures, 3 tables, 10 references. (*"Analytical Chemistry," September,* 1954, *page* 1369.)

New CRANE Corrosion-Resistant Valves in 18-8 SMo and Craneloy 20

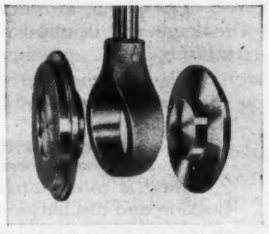
Gate, Globe and Angle Patterns

Few valves for process industries have ever received the quality treatment given this new Crane line.

Note, for instance, the unique yet simple split-wedge disc construction in the gate valves. Those dual identical discs are free to rotate in their holder—the most effective design for resisting galling. The trunnion shape at the back of each disc assures even distribution of closing forces. You couldn't buckle them if you tried.

The globe and angle valves give equally outstanding control of corrosive fluids. A new type disc-stem connection, with minimum clearances, practically eliminates vibration. By placing seating load closer to seats, it provides easier, more accurate closure.

Throughout, these valves are built for better service in your choice of Crane 18-8 SMo Stainless Steel or Craneloy 20. Both lines come with screwed or flanged ends. Full information given in circular AD 2059—available from your Crane Representative or on request to address below.



New split-wedge disc in gate valves combines the benefits of free rotation with uniform seat load pressure.

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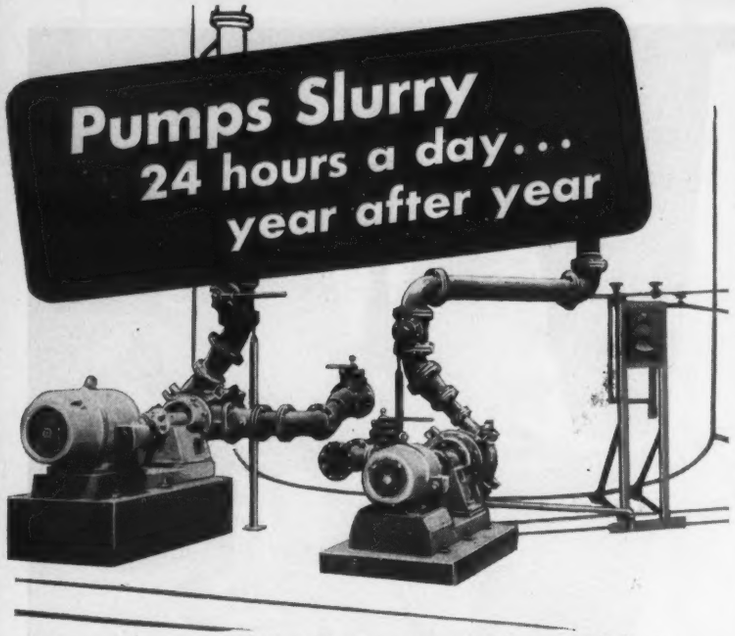

● MORRIS TYPE R SLURRY PUMP at the left is on continuous 24-hr. duty delivering 1000 GPM of a 170° lime slurry at 100′ head. Fifty-HP motor operates at 1180 RPM. Intermittent-duty pump at right delivers 200 GPM at 50′ head with 7½-HP motor turning at 880 RPM.

In slurry-handling operations, "long-term service" is a meaningless claim unless the pump will work day-in and day-out with a minimum of maintenance time, trouble and expense

Morris Type R Slurry Pumps—with an established reputation for longer life—also incorporate in their design exclusive features which result in easier installation . . . fewer interruptions to service...less overhaul...fewer replacements.

To provide uninterrupted service . . .

The gland is under suction pressure only. This reduces leakage and dilution . . . keeps harsh abrasives out of the stuffing box . . . practically eliminates packing troubles.

There are no internal studs or bolts. Caustic and corrosive solutions cannot seep past threads and cause maintenance headaches.

To make installation and dismantling easy . . .

Shell is interchangeable for right or left hand rotation. Suction and discharge nozzles can be rotated around the axis of the pump to a total of 72 different locations.

Impeller removed without disturbing the piping. You simply loosen 4 *outside* clamping bolts and pull off the end cover. This feature alone saves considerable time and labor.

● *Free Service.* Morris Engineers will be glad to recommend the pump best suited to your needs for size, capacity, etc. Send necessary data today . . . include request for Bulletin 181.

MORRIS MACHINE WORKS
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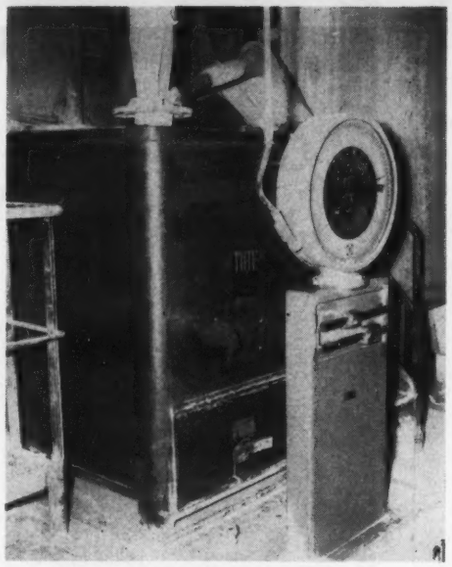
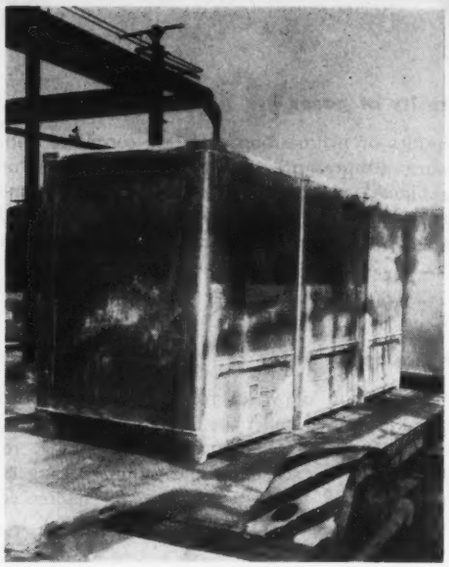
MORRIS *Centrifugal Pumps*

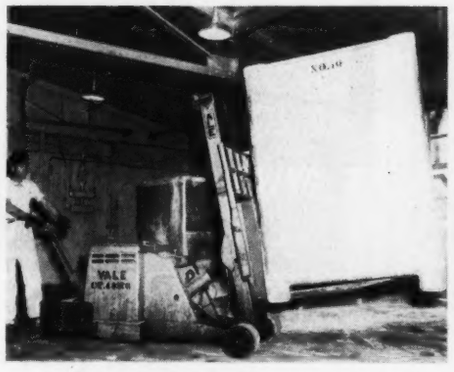
When inquiring check CP 5079 opposite last page



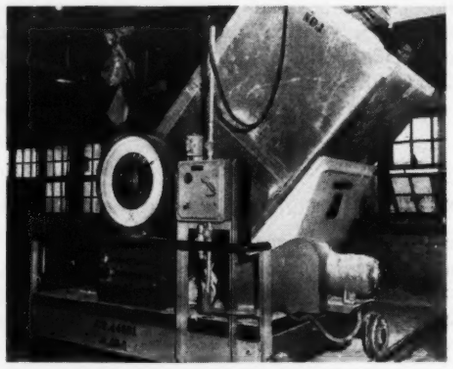
1—Tote Bin filling station where bin is filled with over 1,000 lb of raw material



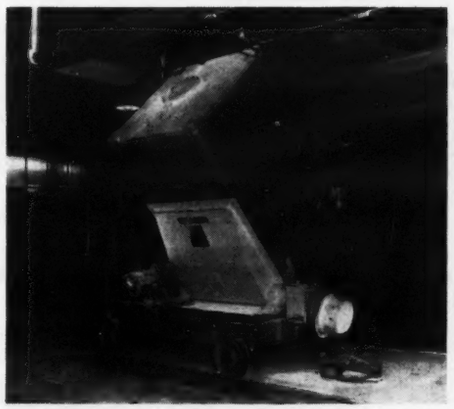
2—Bins on an intra-plant trailer ready for transportation to point-of-use



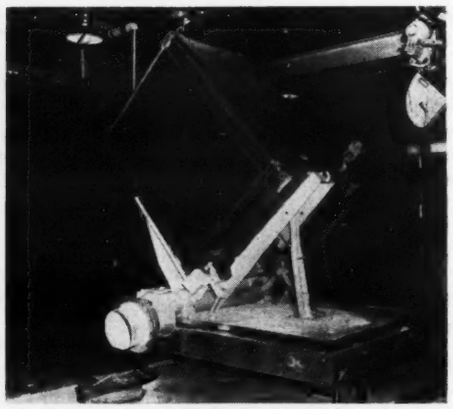
3—Bin on Electric Lift Truck being conveyed to Tote tilter



4—Bin tilted to 45° discharge position



5—Side view shows flexible discharge spout in raised position over reactor #1. The spout is lowered into the reactor for discharge



6—Rear view shows tilting hoist with bin in discharge position

Using twelve large portable bins and tilting unloader helps . . .

eliminate excess handling in intra-plant transporting of powdered material

Spillage reduced, product contamination eliminated and operations speeded with ambulatory arrangement at American Cyanamid

In manufacturing its new rubber accelerator at the Organic Chemicals Division at Bound Brook, N. J., American Cyanamid had a materials handling problem. Company needed a system for transporting finely ground, fairly free-flowing chemical raw material from point-of-supply in one building to point-of-use in another building some distance away. At point-of-use, material had to be metered into any one of several reactors.

Traditional way of solving this material handling problem would have involved something like the following: a) temporarily "package" powdered material at point-of-supply (building "A") into some sort of metal or fiber drums for transportation to point-of-use (building "B"); b) transport material to building "B"; c) have man or team of men in building "B" unload containers, open each and discharge contents (probably by hand) into some sort of hopper-metering arrangement which would feed into reactor.

Such a system, of course, has obvious drawbacks. Filling the empty containers is slow, dusty, and troublesome. In some cases there can also be a health hazard with dusty materials, whether toxic or not, or an explosion hazard with combustible dusts. (Neither of these, however, was involved in Cyanamid's situation.)

Material is lost in spillage or as dust in the air. There is also danger of product contamination. Size of container is dictated by amount a man can lift, and is, therefore, quite small. Besides, there is considerable labor involved in filling the containers, sealing and unsealing, and in discharging into the process, stacking, etc.

With the help of Robert E. Parker and other members of its technical staff, Cyanamid neatly solved its problems with 12 Tote Bins and an ingenious Tilt on wheels. This ambulatory arrangement consists of:

1) Toto tilt which is a mechanism for holding bin at 45° discharge position. At this position bin's hinged door opens and material drops into screw feeder which uniformly feeds material out of a side discharge spout into reactors.

2) Weigh scale which indicates how much material has been fed into reactor. Scale pointer also indicates by uniform motion (or lack of it) that bin contents are being discharged uniformly (or that bridging has not occurred).

3) When bridging does occur, operator merely actuates a vibrator, which helps resume the smooth flow of material.

All of the above equipment is fixed to a wheeled platform on rails. By means of the handle, an operator can easily push the entire rig from one reactor to the other. Thus, one tilting mechanism does the work of two.

As for the bins themselves, they have the following advantages:

1) Each bin is automatically filled with

(*Continued on next page*)

Continuous flow or "spot" handling...

Nearly 50 years of conveyor experience

Standard builds conveying equipment to speed both!

Whatever you need in conveyors . . . whatever you have to handle — Standard engineers are qualified to recommend the most effective application of conveyors to save you time, money and manpower. Thousands of installations speed parts, assemblies, drums, barrels, bundles, cartons, cases, boxes in almost any industry you can name.

Standard can furnish complete engineered systems (comprising power and gravity roller, belt, slat, push-bar and special conveyors). Also available are portable, self-contained conveyor units for "spot" use in warehouse or shipping room (Handibelt, Handipiler, Inclinebelt, Extend-oveyor and Litewate sectional conveyors).

Tell us what you make or handle — or your specific conveyor needs. Call the Standard Conveyor engineer near you. He's listed in your classified phone book. Or write for Standard's General Catalog, address: Dept. CP-25

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PNEUMATIC TUBE SYSTEMS

When inquiring check CP 5080 opposite last page

(Continued from preceding page)

a given specific weight in excess of 1,000 lb of material from a closed system—no dust, no spillage, no contamination, no excessive labor.

2) Bins are easily moved by hand or power lift truck, by one operator, to an interplant trailer which holds eight bins. Thus, they are easily and economically moved from building "A" to building "B".

3) In building "B" they are compactly stored in a corner until ready for use. A power-lift truck easily places them on the Tote tilt for direct discharge into the reactor.

Cyanamid has been using the system since its new rubber chemicals plant opened and has found it up to expectations in every respect.

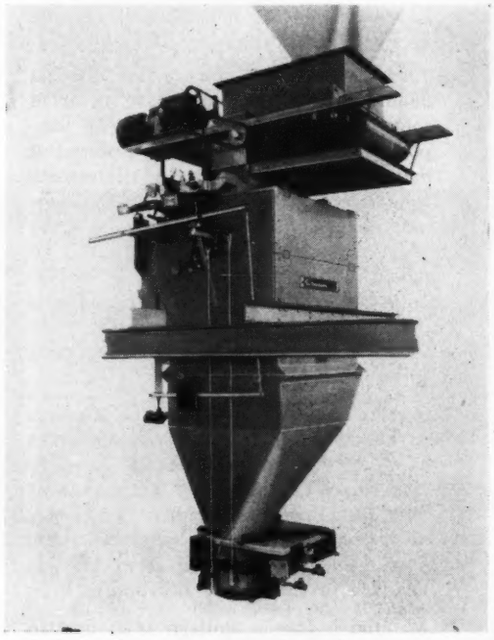
(Tote Bins are a product of Tote Systems, Inc., Dept. CP, Beatrice, Nebraska . . . or check CP 5082 on handy form opposite last page.)

Lumpy material weighed accurately in range of 25 to 100 lb on bagging scale . . .

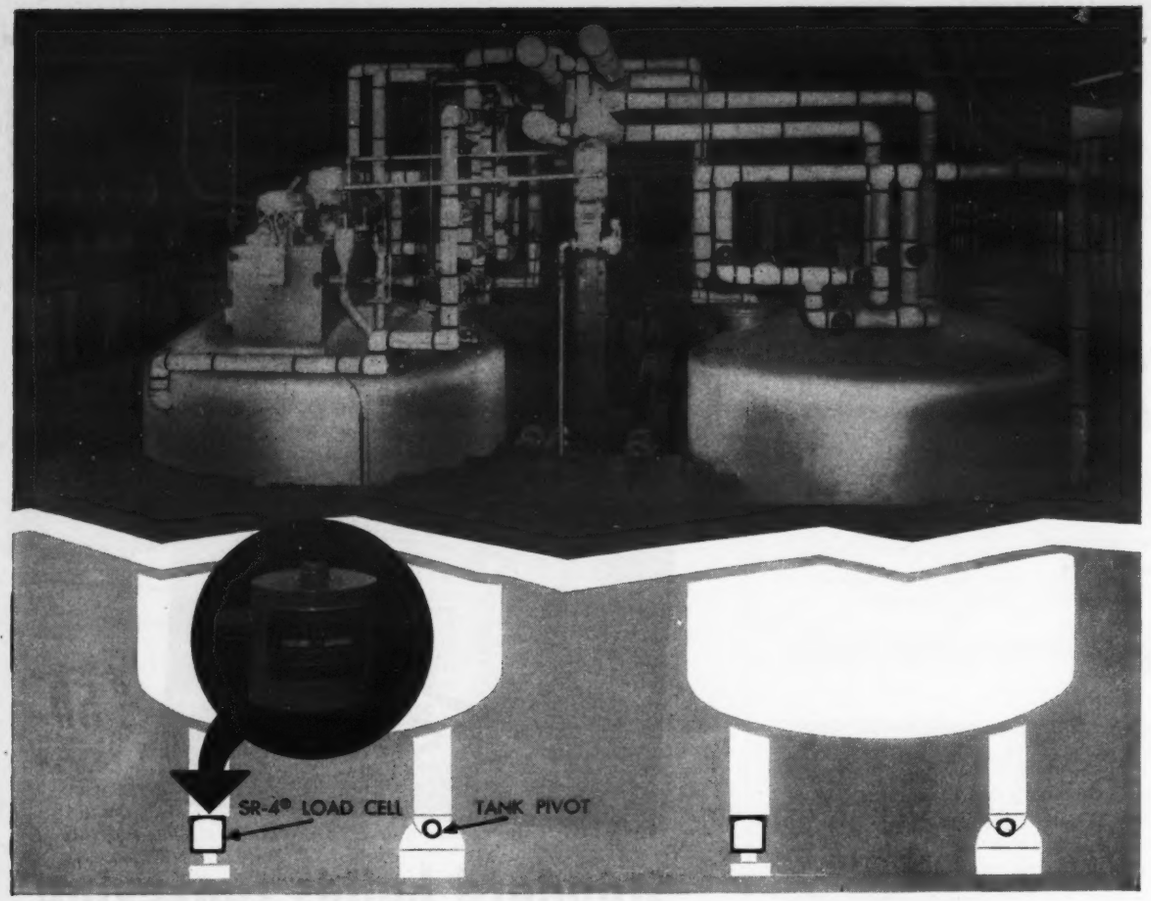
synchronized belt feed and pneumatic inlet gate speed up weighing operations

Uses: For bagging operations in range from 25 to 100 lb. Products handled include chemicals, grains, feeds, food products, fertilizers, rock products, and ceramic materials.

Features: Unit will handle lumpy material such



Scale handles up to ten 100 lb weighings a minute



Baldwin SR-4® Load Cells Permit Remote and Automatic Control of Latex "Batching"

THE PROBLEM:

In order to weigh liquid latex directly in the processing tanks, this leading rubber company sought a method which would require very little head room, use a minimum of steel and control various steps of each batch with ½ of 1% accuracy.

THE BALDWIN SOLUTION:

Every requirement was met by the installation of a Baldwin SR-4 weighing system. Each 2,000 gal. tank, holding 16,000 pounds of latex, is supported by three legs. Two of the legs have rod-end bearings and the third rests on one 10,000 pound SR-4 Type C Load Cell. As the tank fills, changes in its weight are transmitted by electric cables from the cells to a switching unit and an indicator-controller on the upper floor.

This system offers these benefits:

• It controls automatically the entire batching operation, providing lights and alarms for empty and full conditions of the tank. It also has adjustable controls between empty and full for sizing each particular batch by controlling motorized valves.

• The SR-4 system made it unnecessary to use much steel during installation. The small size of the load cells meant that the available headroom (14 inches) was ample.

• The SR-4 Cells' rugged construction and absence of moving parts, combined with good instrumentation and proper engineering, have enabled this system to maintain constantly its inherent accuracy of ¼ of 1% of capacity.

• Due to the electrical nature of SR-4 cells, they could be located on one floor and the indicating-controlling instrument on another.

SR-4 Devices in Industry . . . Uses Unlimited

For measuring load, fluid pressure, or torque more accurately and economically Baldwin SR-4 devices have *unlimited uses* in industry. Write for our two new booklets on tank weighing (No. 4106) and crane scales (No. 4105). Address: Dept. 3111 Baldwin-Lima-Hamilton Corporation, Philadelphia 42, Penna.

BALDWIN-LIMA-HAMILTON

Philadelphia 42, Pa. • Offices in Principal Cities • In Canada: Peacock Bros., Ltd., Montreal, Quebec

When inquiring check CP 5081 opposite last page

as pellets for injection-molding machines and animal feed cubes.

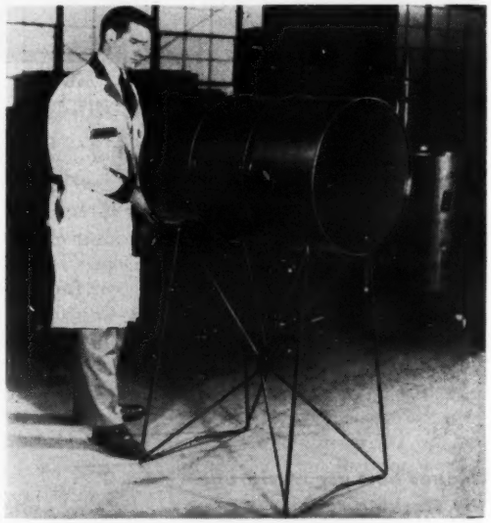
Description: Bagging scale has synchronized belt feeder and pneumatic inlet-gate. Operation of belt feeder is synchronized with operation of scale. When inlet gate closes, feeder drive motor stops. After scale discharges, inlet gate opens and motor starts up again. Scale can handle up to ten 100-lb weighings per minute.

Some current rates being achieved with unit at a southern feed mill are: crumbles at fourteen 50-lb bags per minute, dry mesh feeds at eleven 50-lb bags per minute, and scratch grains at fourteen 25-lb bags per minute. Feeder is equipped with built-in brake and has ¾-hp drive motor. Feeder belt is 22″ wide and made of two-ply rubber.

(Bagging Scale is a product of the Richardson Scale Co., Dept. CP, Van Houten Ave., Clifton, N.J. . . . or check CP 5083 opposite last page.)

Drum pouring made easier with lightweight rack of welded steel

Lightweight storage rack is designed to raise drum spouts to pouring heights. It can also be used for

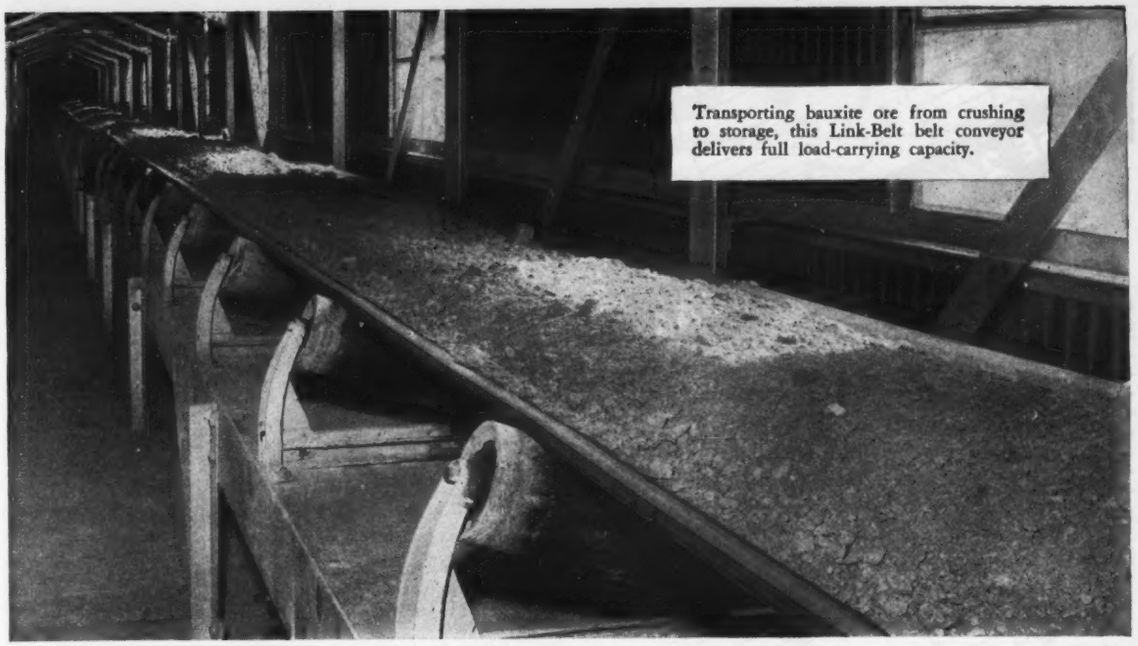


Lightweight rack easily supports filled 55 gal drum and can be taken apart by removing one bolt

storage purposes. Of all steel welded construction, unit will easily support filled 55 gal drum.

By simply removing one bolt, unit is knocked down into compact package for easy storing.

(Rack is a product of the Star Welding Co., Dept. CP, 1054 East 134th St., Cleveland 10, Ohio . . . or check CP 5084 opposite last page.)



Transporting bauxite ore from crushing to storage, this Link-Belt belt conveyor delivers full load-carrying capacity.

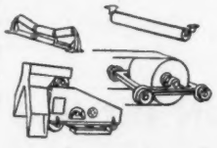
SURE ROAD TO LOWER HANDLING COSTS

. . . carry the load via Link-Belt belt conveyors

LINK-BELT offers you the "total engineering" so necessary for top efficiency

DESIGNED FOR OVERALL EFFICIENCY—Because of its unrivaled experience, Link-Belt can do a better job of gathering and analyzing all data. Proposals reflect this understanding of the most practical way to fit individual conveyors into your overall system requirements for best results.

BUILT FOR LONG-LIFE PERFORMANCE—Link-Belt manufactures all components and related feeders and conveyors. You are assured of the right equipment because of this breadth of line. And Link-Belt will supply the highest grade belts engineered to the specific job.



DELIVERS FULL RATED CAPACITY—Link-Belt follows through on every detail of the job, including electrical controls and even wiring and foundations. What's more, Link-Belt will furnish experienced erection superintendents, staffs and skilled crews at the customer's request.

ASSURES SATISFACTORY PERFORMANCE—When you rely on Link-Belt as a single source for your complete system, we accept responsibility for placing it in full operating readiness. We will also supervise modernization of existing systems. For all the facts call your nearby Link-Belt sales representative.

LINK-BELT

BELT CONVEYOR EQUIPMENT

LINK-BELT COMPANY: Executive Offices, 307 N. Michigan Ave., Chicago 1. To Serve Industry There Are Link-Belt Plants and Sales Offices in All Principal Cities. Export Office, New York 7; Canada, Scarboro (Toronto 13); Australia, Marrickville, N.S.W.; South Africa, Springs. Representatives Throughout the World. 15.406-A

When inquiring check CP 5085 opposite last page

THESE 240 STANDARD GAS CYLINDERS EQUAL

ONE
TAYLOR-WHARTON
38 TUBE GAS
TRANSPORT

TAYLOR-WHARTON GAS TRANSPORTS mean safety, economy and convenience. Available in 30 and 38 tube, single or double axle construction, these units are now successfully carrying: Oxygen, Nitrogen, Helium, Boron Trifluoride, and Hydrogen. Your solution to problems of high pressure gas storage or bulk transportation.

WRITE FOR NEW DESCRIPTIVE BULLETIN TODAY.

TAYLOR-WHARTON IRON & STEEL CO.
CINCINNATI 12, OHIO
Also Manufacturers of: Manganese Steel Castings, Alloy and Carbon Steel Castings, Special Trackwork, Gas Cylinders

When inquiring check CP 5086 opposite last page

Eliminates rehandling small parts from shipping containers to standard bins . . .

parts can be put into assembly line without delay with unit

Uses: As a holder for small parts in assembly or production areas. Hopper may also be used as a storage bin.

Features: Of all-welded ten gage steel, hopper is balanced so that it can be easily and safely rotated, even by female workers.

Description: In use, full box or keg with lid removed is slid into hopper through back panel

Worker takes parts from hopper which eliminates rehandling from shipping container to standard boxes

opening. Retaining lid is secured and unit rotated on its pivot trunnions. Flow of parts into hopper tray is regulated by adjustable sliding gate.

(Nestier Rollover Hopper is a product of the Chas. Wm. Doepke Mfg. Co., Inc., Dept. CP, 8825 Blue Ash Rd., Rossmoyne, Ohio . . . or for more information reader may simply check CP 5087 on the convenient Reader Service slip opposite last page.)

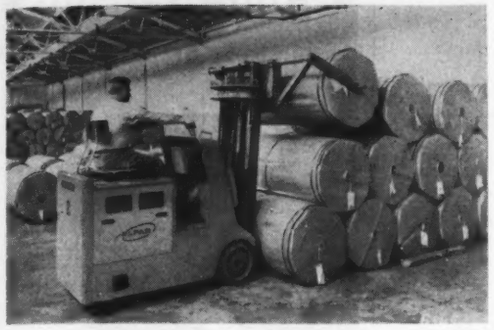
Makes best use of storage by stacking rolls pyramid fashion . . .

cradle arms allow operator to reach points not accessible with ordinary forks

Uses: To store rolls in pyramid fashion for maximum use of storage space.

Features: Cradle attachment permits reaching into pile to pick up rolls not ordinarily accessible when using standard forks.

Description: In operation, rod or bar is in-



Cradle arms permit pyramiding of rolls

serted through core of roll, extending slightly from each end. Notches on ends of cradle arms engage rod to pick up load. To deposit load, truck's elevator mechanism is lowered until load rests on floor, free of arms.

Various arm lengths may be designed depending on size and weight of load and reach desired.

(Attachment is product of Elwell-Parker Electric Co., Dept. CP, 4205 St. Clair Ave., Cleveland 3, Ohio . . . or check CP 5088 opposite last page.)

Are you wondering why many of these editorial articles give . . .

Manufacturer's Name and Address . . . ?

You doubtless have noted names and addresses of manufacturers at the end of editorial articles in CHEMICAL PROCESSING. Have you wondered, "Is this some sort of advertising?"

It isn't . . . that "source" is there because the editors know that often you want more information, quickly and easily. Of course, such articles are purely editorial material which has been selected by the editors as being worthy of your attention . . . (it is **not** carried with any responsibility to the manufacturer nor does it obligate the manufacturer). This is strictly a service for you . . . the reader.

We know that many readers often want more than just the pertinent description and facts . . so we tell you where and how you can obtain complete details, either by writing direct or using the handy Reader Service slip.

This is one of our extra Reader Services, pioneered in this field by CHEMICAL PROCESSING in 1938.

THE EDITORS

RUGGED?

10 hp CARRIER CONVEYOR Moves 84,000 Foot-Tons Per Day!

THERE'S almost no limit to how rugged a Carrier Natural-Frequency Conveyor can get. Nor to what "impossible" jobs it can do. That's because Carrier Conveyors operate according to the laws of Natural Frequency and the application of this scientific principle was pioneered exclusively by Carrier.

NATURAL FREQUENCY: Carrier Natural-Frequency Conveyors substitute the natural resonant action of springs for brute force — thus UTILIZING the tremendous force of periodic vibration which, before Carrier, was considered a liability. Most of the power needed to operate Carrier Natural-Frequency Conveyors is repeatedly stored up in the springs, and returned on every stroke. The result — *much less power required . . . far less maintenance . . . far less down-time!*

Carrier Natural-Frequency Conveyors are now delivering incomparably efficient, trouble-free performance for many of America's biggest industrials. Mail the coupon, *today*, for all the facts.

150 Tons Per Hour Of Foundry Sand Handled With 10 hp!

Handling up to 150 tons per hour of foundry sand — including occasional sprues and tramp iron — is a rough, tough job. But it's a *cinch* for this 70-foot Carrier Natural-Frequency Conveyor! This big Heavy-Duty unit has a ⅜" steel-plate pan, 36" wide, and is powered by one 10 hp drive. Vibrated weight is approximately three tons. More than 50 giant coil springs are used. Full details gladly sent on request.

CARRIER ADVANTAGES

HIGH CONVEYING SPEED
(Up to 100 feet per minute)

GREATER CAPACITY
(Up to 200 tons per hour)

LESS POWER REQUIRED
(About one-third as much as "competitive" equipment)

LESS MAINTENANCE & DOWN-TIME
(Less power + good design = trouble-free performance)

NO DAMPENING UNDER LOAD
(Designed with extra power for specified load, with positive stroke)

SELF-CLEANING
(Continuous, smooth trough — no pockets)

COMBINES PROCESSING WITH CONVEYING
(Can screen, dry, cool, dewater, blend, etc.)

WIDTHS FROM 6" TO 48"—LENGTHS FROM 5' TO 250'
(With pans 16 ga to ½" plate, of any metal, open or enclosed)

BALANCED, VIBRATION-FREE UNITS AVAILABLE
(For use on ceilings or light floor construction)

CARRIER
~~NATURAL-FREQUENCY~~
CONVEYORS

Carrier Conveyor Corporation
2140 Frankfort Avenue, Louisville 6, Kentucky

Gentlemen: Without obligation, please send me Carrier Natural-Frequency Conveyor Bulletin No. 111.

Firm_____

Street_____

City_____ State_____

Att. Mr._____ Dept._____

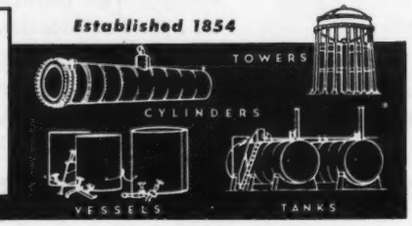
When inquiring check CP 5089 opposite last page

1854 R.D. COLE Centennial 1954

TEN YEARS before the BATTLE OF ATLANTA

In 1854, ten years before the Battle of Atlanta, we started out as a small iron-works. Many communities and many mills secured their first elevated tanks for water supply from us. For the privilege of celebrating our Centennial, we express our appreciation for the friendship of four generations of customers, and the loyalty of four generations of workers.

R.D. COLE
MANUFACTURING CO.
NEWNAN, GA.

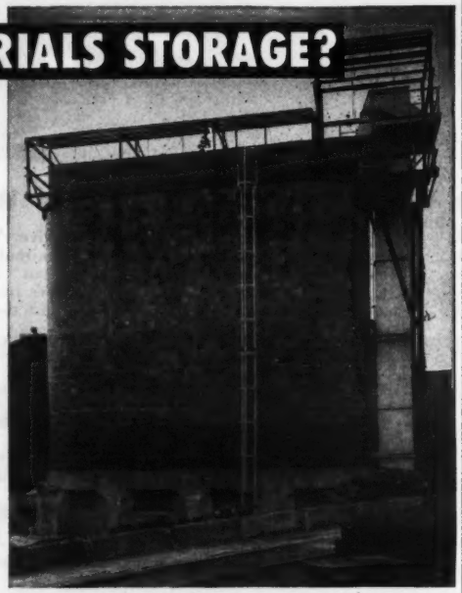


BULK MATERIALS STORAGE?

...here's the answer to your problems...

Kalamazoo
GLAZED TILE
INDUSTRIAL STORAGE BINS

Any shape or size engineered to meet your requirements . . . heavy, monolithic construction . . . smooth-surfaced . . . weatherproof, fireproof, corrosion-proof . . . contents protected against freezing, condensation, spoilage, contamination . . . appearance that ties in with modern industrial buildings . . . . . . long-lived.



Sand handling installation at large Ohio foundry. *Kalamazoo* design and construction provides more useable space than ordinary multiple bins.

Send for complete details...

INDUSTRIAL STORAGE BIN DIVISION

***Kalamazoo* TANK and SILO COMPANY**

245 HARRISON STREET • KALAMAZOO, MICHIGAN

When inquiring check CP 5090 opposite last page

Speeds transporting of materials in big bulk handling jobs

Uses: For bulk handling of materials like salt for processing, malt for breweries, sulfur, lime, sand, and bauxite.

Features: Units are available to meet any unloading need. Four discharge arrangements are possible — screw conveyor, belt and bucket elevator, belt conveyor and distributor for spreading purposes.

Description: Automatic, self-unloading Bulkmobile has discharge speeds ranging from ½ to 2 tons per minute.

There is full hydraulic operation for both body

Self-unloading unit for bulk handling of materials

conveyor and discharge accessories, compartmented body for multiple deliveries, and externally-operated compartment doors.

Models are available in lengths from 15 to 33 feet, with body sides up to 36" high. Body shown in illustration has capacity of 780 cu ft.

(Bulkmobile is a product of Baughman Mfg. Co., Dept. CP, Jerseyville, Ill. . . . or for more information check CP 5091 on handy form opposite last page.)

Direct electric starting system utilizes glow plug to provide all-weather starting

Uses: To provide positive starting for tractors in below zero weather, and to prevent battery life from being drained away through prolonged cranking of diesel engines during winter months.

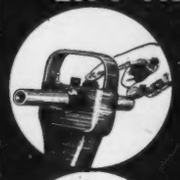
Features: The 24 volt electric starting system uses glow plug attachments to provide heat to precombustion of the diesel engine for faster starting.

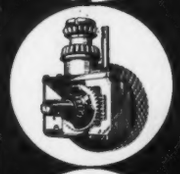
Description: Glow plug, heart of the direct starting system, is about the size of a pencil. It is actually a heating element, part of which ex-

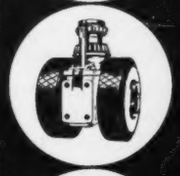
4 Big Reasons

why you should buy a

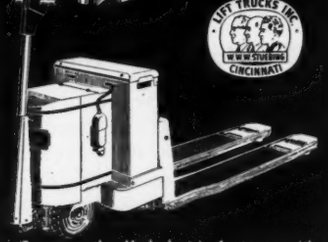
HydroLectric LIFT TRUCK


CONTROL COMPLETE at your finger tips


SEALED ALLOY GEAR DRIVE for long service life


TWIN DRIVE WHEELS with differential for ease of steering and good stability

HEAVY DUTY MOTOR completely enclosed—highly efficient easy accessibility

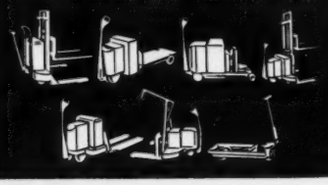


Compare the Hydrolectric features with any other "Driver Lead" Lift Truck. The Hydrolectric quality of construction merits your inquiry. Two driving wheels instead of one — 50% easier steering — ease of maintenance.

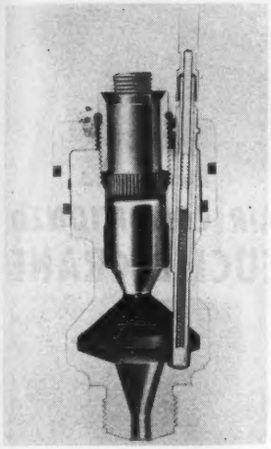
Write for Catalogue 35 today showing various models and their features. NOTE: The Dyna-Dual Power Unit is interchangeable on all models.

LIFT TRUCKS INCORPORATED

7423-31 SPRING GROVE AVE. CINCINNATI 14, OHIO



When inquiring check CP 5092 opposite last page



Glow plug extends into precombustion chamber and acts as heating element

tends into precombustion chamber of the diesel engine. Its construction is similar to that of heating element of domestic ranges.

Fine resistance wire fits inside tube or sheath and entire cavity is filled with magnesium oxide. Tube is run through a die to reduce diameter and compact magnesium oxide tightly around resistance wire. Magnesium oxide acts as support and electrical insulator for wire and sheath.

When electric current is applied to wire, heat is transferred to the sheath. Sheath hits temperature of 1800°F in about 30 seconds. This heats air in precombustion chamber and aids in igniting fuel injected into chamber when engine is cranked.

Direct electric starting system using glow plugs is being made available as original equipment for the Caterpillar D4 track tractors.

(Information courtesy of the Caterpillar Tractor Co., Dept. CP, Peoria, Ill. . . . or for more information about the starting system check CP 5093 on handy form opposite last page.)

Does your plant need modern material handling methods . . . ?

check the handy Product Directory (pages 217 to 220) for a quick reference to ideas and equipment in this issue.

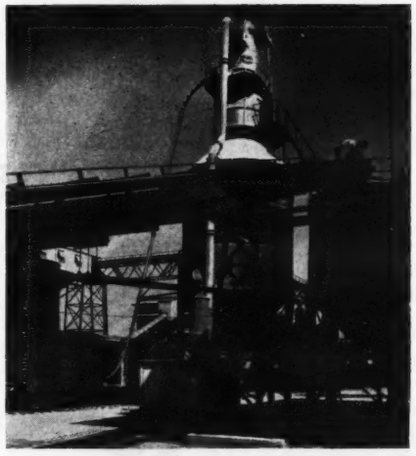
The AIRVEYOR DOES A JOB FOR MANY PULP AND PAPER MILLS

International Paper
Fibreboard Products
St. Regis Paper
Buckeye Cellulose
Hudson Pulp & Paper
Rayonier, Inc.
Macon Kraft
Gaylord Container
Brown Paper Mill
Eastern Corp.
Fraser Paper
Oxford Paper
W. Virginia Pulp & Paper
Tileston & Hollingsworth
Fitchburg Paper
Escanaba Paper
Blandin Paper
Minnesota & Ontario Paper
Brown Co.
Finch-Pruyn
Newton Falls Paper
Riegel-Carolina
Chillicothe Paper
Mead Corporation
Oxford-Miami
Crown-Zellerbach
St. Helens Pulp & Paper
Scott Paper
New York & Pennsylvania
Bare Paper
Glatfelter Co.
Bowaters-Southern
East Texas Pulp & Paper
Champion Paper & Fibre
Camp Mfg. Co.
Chesapeake Corp. of Va.
Puget Sound Pulp & Timber
Weyerhauser Timber
Consolidated W. P. & Paper
Kimberly-Clark
Ketchikan Pulp
MacMillan & Bloedell
Smith Paper Mills
Dryden Paper
KVP Company
Marathon Paper
Ontario Paper
Brown Corp.
Canada Paper

The constantly growing list of users of the Airveyor Conveying System in the pulp and paper industry, attests to the ability of this system to perform in a most highly satisfactory manner for the handling of mill-supply chemicals . . . soda ash, salt cake, starch, lime, and clays. We point with pride to the many outstanding companies with whom we have had the privilege of working, being able to engineer and build equipment that will serve them for many years, at the lowest operating and maintenance cost.

Well over one hundred Airveyor Systems are in operation in the pulp and paper industry in the United States and Canada, individual company purchases ranging from one to twelve systems, depending upon their requirements. Once the Airveyor is installed, and production requirements necessitate additional capacity, repeat orders are the rule . . . a sure indication that the Airveyor does a worth-while job in the industry.

If you have an unloading or in-plant conveying problem, take advantage of Fuller's over a quarter of a century experience in air-conveying. A study of your problem will cost you nothing. Write us today.



FULLER COMPANY — Catasauqua, Pa.

Chicago—San Francisco
Los Angeles—Seattle—Birmingham

Fuller ••• *pioneers in Air conveying* A-191 2331

When inquiring check CP 5094 opposite last page

CONSULT FOR THE BEST
P-S Materials HANDLING EQUIPMENT
DRUM AND BARREL SLING
Loading and unloading trucks and for general purpose handling. Handles drums for draining purposes. Pick up drum from lying position and set on end. Handles drums, barrels, kegs—anything with a lip. Half-ton capacity. Weight app. 8½ lbs.
Item B-205
CARBOY TRUCK
Item B-416
BARREL CRADLE
Item B-539
All metal PALLET
DRUM and BARREL TILT
Item B-731
$181.50
A barrel tilt for controlled, precision dumping or pouring. Ideal for chemicals, solvents, powders, etc. Turns 360° through worm drive.
Equipped with two safety type locking devices and all-steel, welded yoke. Hand-operated chain drive.
Item B-591
MULTI-PURPOSE CART
Combination TRUCK and DRAIN RACK
Loads Automatically
Moves barrels or drums, also serves as drain rack. Two styles—with or without detachable handles. Sturdy frame-welded construction. Weight approximately 90 lbs.
Item NS-506 (Handles welded to frame) $46.75
Item NS-506 DH (Detachable handles) $48.95
Item B-500
TRAILER TRUCK side dump
Item B-746
CORRUGATED BOX with legs
Corrugated STEEL PLATFORM
Item S-703
Industrial DUST PAN
Item B-470 from $24.20
BARREL and BOX SKID
All-Steel
This new skid, although much lighter in weight and easier to handle than the old fashioned, clumsy wood skids, is made entirely of steel, welded construction and will out-last any wooden skid that was ever made. Will stand up under the heaviest barrel or box. Skid measures 14" wide overall. Attractively priced.
Item B-911
BARREL TRUCK loads automatically
WHEN ORDERING always give "Item" number. All PRICES are f.o.b. Detroit. Prices are subject to change without notice.
Write for catalog
DESIGNED AND MANUFACTURED BY
Palmer-Shile Co.
16016 FULLERTON AVE., DETROIT 27, MICH.
When inquiring check CP 5095 opposite last page

MATERIAL HANDLING

Stacks, dispenses pallets automatically

Uses: Dispensing empty pallets to conveyor or loading lines.

Features: Stacker and dispenser are portable and can be moved to any required point of operation.

Description: Pallet stacker is placed at pallet unloading point, and as workman empties pallet it is placed on short conveyor. It

Makes pallet handling automatic

rolls into stacker where it is automatically raised into magazine.

Automatic pallet dispenser feeds single empty pallet to either conveyor or other desired point.

(Stacking and Dispensing equipment are products of the Beacon Machinery, Inc., Dept. CP, Box 188, East St. Louis, Ill. . . . or for more information check CP 5096 on handy form opposite last page.)

Speeds order spotting on loading docks . . .

conveyor unit allows cartons to be shunted from line

Conveyor unit is designed to speed and simplify order spotting. It employs a flexible joint which moves over a stationary slider bed.

Attached to this is a 5′ portable mounted tail section of wheel or roller gravity conveyor.

Unit is floor mounted with receiv-

FUMES and HEAT present NO Operational Problems

with this AIR CONDITIONED EUCLID CRANE

Designed and equipped especially for efficient operation over equipment and machinery where high temperatures or noxious fumes are present. An air-conditioning unit removes dust, cools the air and neutralizes fumes with activated carbon filters. Other special features include: slip ring motors with glass insulation and thermo guards; protective baffle plate under trolley and thermo pane windows.

Side view of cab showing air-conditioning unit

Euclid Cranes

GET OUR NEW CATALOG

The EUCLID CRANE & HOIST Co.
1368 CHARDON ROAD
CLEVELAND 17, OHIO

When inquiring check CP 5097 opposite last page

IN A FILTER OR STRAINER IT'S

FOR BETTER SERVICE

"CLEVELAND" FILTERS AND STRAINERS

No task too big — no problem too small for CLEVELAND strainers and filters. We design, build and produce strainers and filters for every purpose in any size or dimension or metal.

Easy to order — our engineers will help you to analyze your problem. Send us your requirements!

WRITE FOR BULLETIN NO. 7

THE CLEVELAND WIRE CLOTH & MFG. CO.
3574 E. 78 STREET · CLEVELAND 5, OHIO

When inquiring check CP 5098 opposite last page

FOR DEPENDABILITY
and
TOP PERFORMANCE

METAL EQUIPMENT for *Chemical Processing*

by **GLASCO**

Backed by almost a half century of experience and metallurgical know-how, Glasco designers and craftsmen offer exceptional fabricating facilities for any chemical processing equipment you may require.

For maximum durability, and long, trouble-free service it will pay you to specify metal equipment fabricated by Glasco.

The range of Glasco products includes every type of equipment from standard trays, racks, bins, hoppers, cabinets, trucks, etc., to the largest and most complex units; also highly specialized equipment in which heat transfer or pressure are concerned.

Why not visit our plant to consult with our experts, and to find out why Glasco can render exceptional service to you.

Write for descriptive literature today.

GLASCO EQUIPMENT CORP.
Pioneer Fabricators of Stainless Steel Equipment
10 WAIT STREET — GLASCO PRODUCTS — PATERSON 4, N. J.

Phila. Area: Marple Organization, 1200 Commercial Trust Bldg., Philadelphia 2, Pa.
New York State: Sanders Industrial Equip. Co., 1351 Broadway, Albany 4, N. Y.
South: Henry H. Hersey Co., 44 Norwood Place, Greenville, So. Car.
New England: Harris & Underhill, 446 Statler Bldg., Boston, Mass.

When inquiring check CP 5099 opposite last page

Tail section of conveyor unit moves through 80° arc

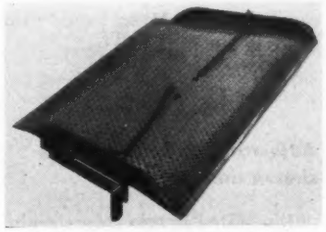
ing end attached to discharge end or shipping room conveyor. Tail section extends onto loading dock where it can be moved through arc of 80 degrees. Conveyor is available in 11½, 15, and 18″ widths.

(Flex-A-Tail conveyor unit is produced by Metzgar Conveyor Co., Dept. CP, 449 Douglas St. N.W., Grand Rapids 4, Mich. . . . or for more information check CP 5100 on handy form opposite last page.)

All-welded construction produces strong ramp

Steel ramps for both car loading and truck loading are of all-welded steel construction.

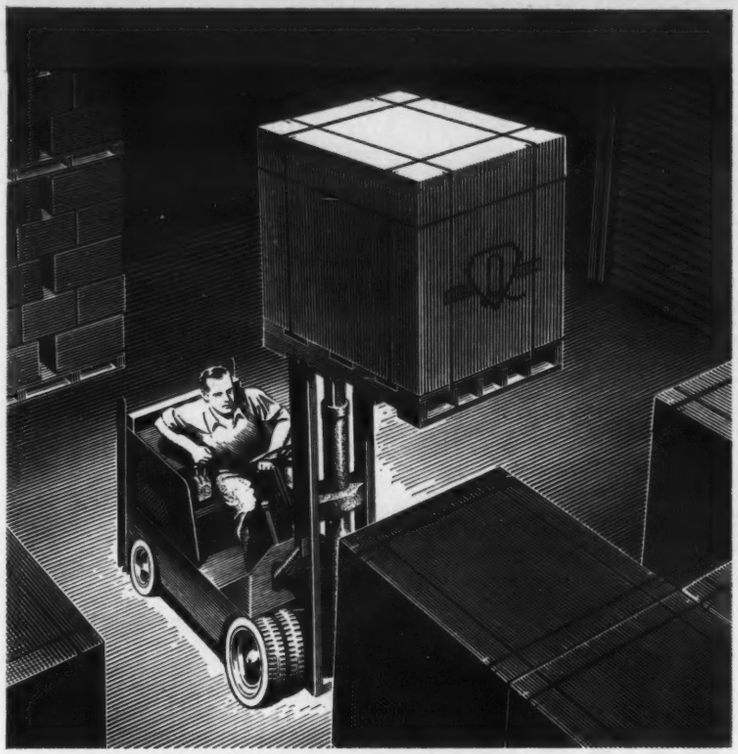
Truck loading ramps are made in capacities from 4000 to 8000 lb, are 48″ wide and come in lengths



Ramp is safe and rugged

from 36 to 72″. Special design accommodates trucks higher or lower than dock level.

(Ramps are a product of Penco Engineering Co., Dept. CP, 25 California St., San Francisco 11, Calif. . . . or check CP 5101 on handy form opposite last page.)



Help Your Product "STACK UP" Better

In the warehouse you'll save valuable space because precision-made Gaylord Boxes stack solid, straight...and taller.

In shipment your products will "stack up" better in the eyes of all who see them when they're dressed in eye-catching Gaylord containers.

On arrival your products will "stack up" best; for protection-engineered Gaylord Boxes deliver them in the same good condition in which they left your plant.

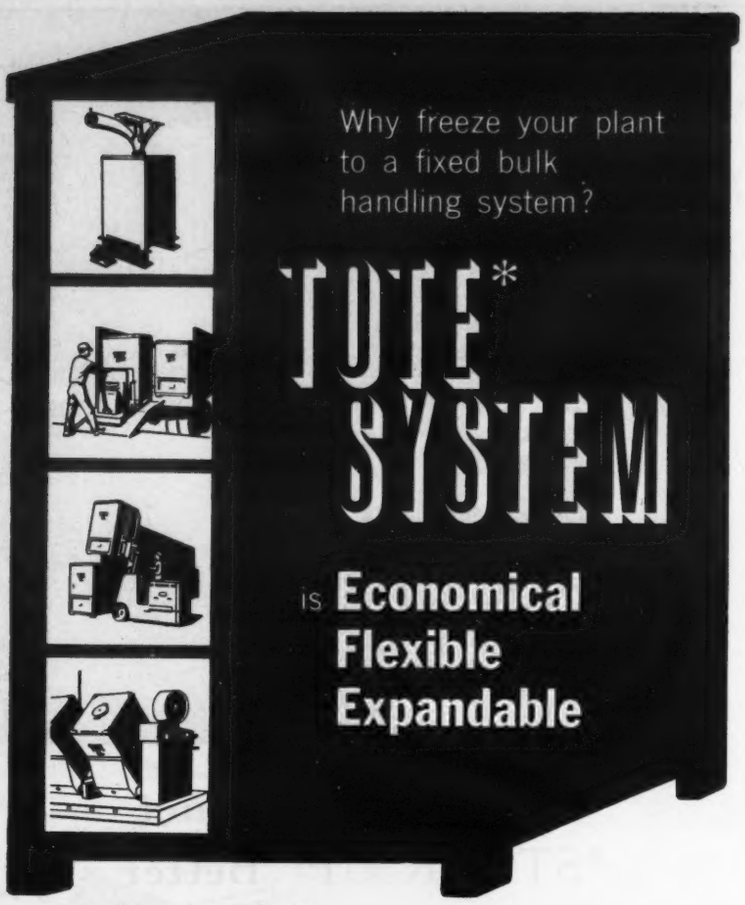
Stack the cards in favor of your product. Call your nearby Gaylord sales office today!

Gaylord Boxes

CORRUGATED AND
SOLID FIBRE BOXES • FOLDING CARTONS
KRAFT PAPER AND SPECIALTIES
KRAFT BAGS AND SACKS

GAYLORD CONTAINER CORPORATION • ST. LOUIS

SALES OFFICES FROM COAST TO COAST ★ CONSULT YOUR LOCAL PHONE BOOK



consider these facts:

1. Tote System is a *complete* bulk material handling system built around easily handled and transported aluminum bins plus automatic filling and discharging equipment.
2. Tote System is completely flexible —can be readily adapted to present and future plant layout.
3. Tote System is now being used by hundreds of manufacturers and processors to handle thousands of tons of bulk materials every week.
4. Among the many applications of Tote System are these:
   - For inter-plant shipment of bulk materials.
   - For in-plant storage and handling, including temporary storage of surge capacity between production and packaging.
   - For accurate and automatic weighing and blending.
5. Tote System saves time and labor ...container costs...storage costs ... losses due to weather and deterioration ... losses due to spillage, sifting and dusting ... losses due to rodents and insects ... original product quality.

Some of the materials now being handled are cement • sugar • flour salt • plastics • soy meal • ethocel powders • whiting • feed • carbon black • phosphates • detergents silicones • soluble coffee • soluble tea • phosphor powders • dacron sherbet powders • soft drink mixes cake mixes • titanium sponge

Tote Engineers will survey your plant to determine the savings you can effect—at no cost or obligation.

Meanwhile, write for illustrated literature.

*Tote and Tote System Reg. U. S. Pat. Off.

TOTE SYSTEM, inc.

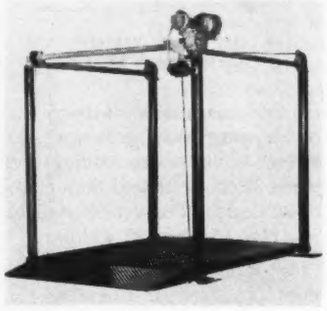
680 SOUTH 7TH BEATRICE, NEBRASKA

When inquiring check CP 5102 opposite last page

Electric hoist installed without excavation

Because no ground excavation or special foundation is necessary, hoist may be placed on upper floors, driveways or other locations where loading is necessary.

Lifting power is supplied by motor operating simple cable mechanism which raises steel plate



Lifts loads to 6 ft heights

platform to heights up to 5'10-3/8". Platform is reinforced by steel beams to stand up under impact loads of power-operated trucks.

Upward loading slope to the 4-3/8" platform is provided by 24" wedge shaped ramp. Hoist has adjustable automatic top and bottom limit stops, centrifugal governor and safety break. Models include caster-mounted types for portability.

(Electro-Loader is a product of the Globe Hoist Co., Industrial Div., Dept. CP, East Mermaid Lane at Queen St., Philadelphia 18, Pa. . . . or check CP 5103 on handy form opposite last page.)

Adjustable loading ramps shown and explained

Illustrated in two colors, eight-page bulletin explains operation and installation of adjustable loading ramps. Units are available in five and ten ton capacities and in widths up to six feet.

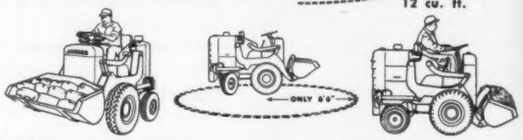
Bul 953 is issued by Rite-Hite Div., Loomis Machine Co., Dept. CP, Clare, Michigan. Check CP 5104 opp. last page.

REACHES HIGHER, FARTHER

to bring you lower costs

Your Load-Plus Auto-Scoop will do jobs that other scoop loaders can't handle. Dumps over edges of trucks, bins or hoppers up to 6'8" high, reaches to 2'7", to place loads to best advantage. Simple, hydraulic boom and bucket control. Note other performance advantages. Write for Catalog L12-4.

JAEGER LOAD-PLUS auto-scoop 12 cu. ft.



10% more power (33 hp @ 1800 rpm); 20% greater lifting capacity (1200 lbs.).

5" shorter turning radius (6'6"). Up to 25% faster speeds (to 13.88 mph in reverse, 7.66 forward).

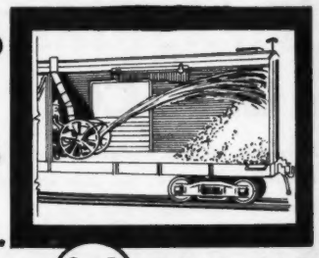
Low bucket tilt-back assists full bucket loading, permits carrying low (4½" from ground).

1 cu. yd. Load-Plus available for bigger work.

THE JAEGER MACHINE COMPANY, 616 Dublin Avenue, Columbus 16, Ohio

When inquiring check CP 5105 opposite last page

LOAD AND TRIM BOX CARS *FASTER, CHEAPER..* with **S-A BOX CAR LOADERS**



S-A Loaders and Pilers will SAVE YOU MONEY with every car you load. One man, working part-time can load and trim up to 150 tons per hour of granular material up to 2" lump size.

PRICED AS LOW AS **$762.00** F.O.B. AURORA

IN STOCK... FOR IMMEDIATE DELIVERY

WRITE TODAY FOR COMPLETE INFORMATION

STANDARD PRODUCTS DIVISION

STEPHENS-ADAMSON MFG. CO.

11 Ridgeway Ave. Aurora, Illinois

When inquiring check CP 5106 opposite last page

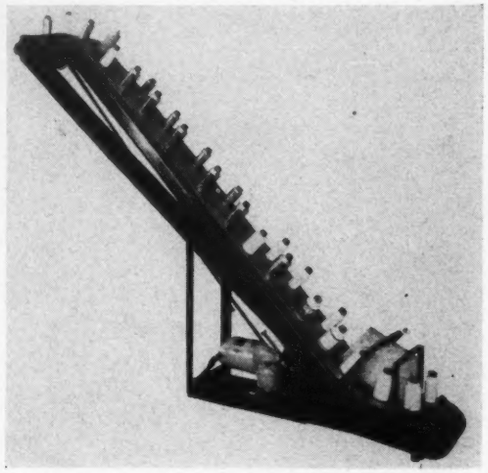
Can-handling operations speeded by eliminating conveyor belts which slope gradually . . .

magnetic conveyor allows tin cans to climb steep incline without spills or pileups

Uses: For continuous line processing of materials in cans.

Features: Magnetic bed full length of inclined section of conveyor makes possible smooth, uninterrupted inclined travel of cans in single or multiple rows.

Description: Use of magnetic conveyor allows



Magnetized conveyor eliminates need for gradually sloping conveyor

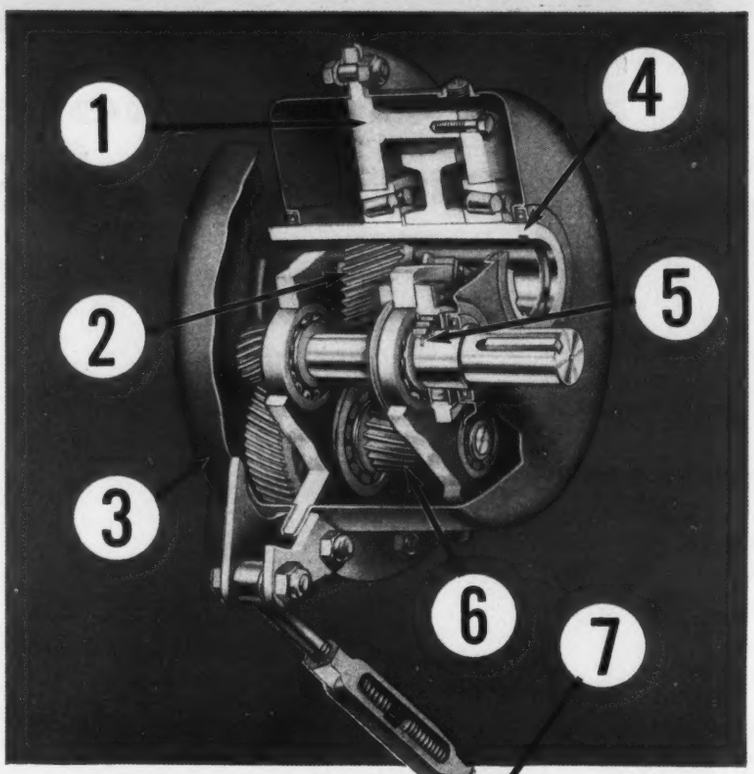
cans to travel up steep grades and eliminates need for gradually sloping conveyors. This results in saving of production space. Spills and pileups are also eliminated with the unit.

(Magniveyor is a product of the Magnetic Engineering & Mfg. Co., Dept. CP, Clifton, N.J. . . . or check CP 5107 opposite last page.)

Data sheet describes portable dumper

Data sheet describes how portable drum dumper is moved from one location to another, how push-button operation eliminates manual handling, and how a dumper mechanically elevates and upends containers for dust-free even-flow emptying. Also included are photographs and line drawings illustrating dumper.

Data Sheet on Drum Dumper is issued by Gifford-Wood Co., Dept. CP, 23 High St., Hudson, N. Y. Specify CP 5108 opposite last page.



Here is the "INSIDE INFORMATION" on FALK ALL-STEEL Shaft Mounted Drives

Take a careful look inside the Falk all-steel Shaft Mounted Drive, and you will know why this newest member of the famous Falk family is ideal for applications where direct mounting on the driven shaft is desirable. It is the only drive in its field with all these superior "In-built" factors:—

1 **All-steel Frame,** with more than double the rigidity of iron, supports all rotating elements.

2 **Precision Helical Gears,** designed and machined by Falk, rated to AGMA standards.

3 **Pressed Steel Housings,** whose sole function is to keep oil in, dirt out; easily removed for gear inspection without dismounting unit.

4 **Through Hollow Shaft** with counter bore provides for easiest installation or removal from driven machine shaft extensions.

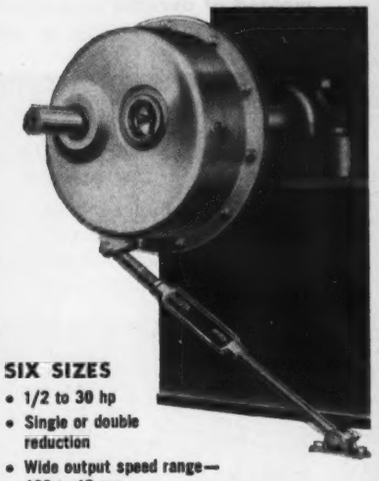
5 **Backstop** can be furnished with the unit or added later for positive prevention of reverse rotation.

6 **Positive Lubrication,** continuous direct dip of revolving elements at all speeds.

7 **Tie Rod** and turnbuckle serve as anchor and facilitate V-belt or chain adjustment.

Write to Department 247 for engineering bulletin, including selection and dimension details.

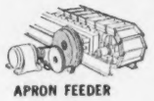
EFFICIENT SPEED REDUCTION IN LIMITED SPACE



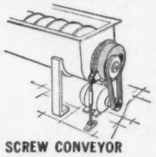
SIX SIZES
- 1/2 to 30 hp
- Single or double reduction
- Wide output speed range—420 to 10 rpm

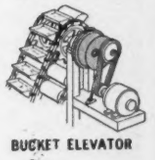
Expressly designed for topflight performance on installations requiring considerable speed reduction in limited space, the all-steel FALK Shaft Mounted Drive has quickly won acceptance throughout industry. This sturdy, compact, versatile reducing unit is an ingenious variation of the highly successful FALK Motoreducer design, pacemaker in its field for more than 20 years. Here, the time-proved design is adapted for mounting directly on the shaft to be driven, using V-belt connection to motor. Investigate now!

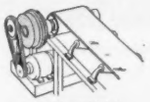
A FEW TYPICAL APPLICATIONS

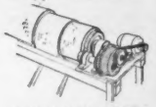

APRON FEEDER

LINE SHAFTING


SCREW CONVEYOR


BUCKET ELEVATOR


BELT CONVEYOR


GRAVEL CLASSIFIER

THE FALK CORPORATION, Milwaukee 8, Wisconsin

MANUFACTURERS OF

- Motoreducers
- Speed Reducers
- Flexible Couplings
- Shaft Mounted Drives
- High Speed Drives
- Special Gear Drives
- Single Helical Gears
- Herringbone Gears
- Marine Drives
- Steel Castings
- Weldments
- Contract Machining

FALK

. . . a good name in industry

When inquiring check CP 5109 opposite last page

Corrosion-proof pans molded of durable fiberglass . . .

tote pans afford 50% weight reduction over metal

Uses: Handling small parts, chemicals, food and drug products.

Features: Rugged tote pan provides 50 per cent weight reduction over metal counterpart and has stacking pads molded on

outside of corners for secure locking and additional reinforcement. Smooth pan finish provides easy-to-clean surface.

Description: Toteline pan is dimensionally stable from −60° to 250°F. Pans will not dent or bend out of shape. Handles are molded in each end for easy lifting. Seamless construction facilitates cleaning.

(Toteline pans are products of Molded Fiberglass Tray Co., Dept. CP, Linesville, Pa. Check CP 5110 opposite last page.)

Pneumatic conveyors described, illustrated

Bulletin of 16 pages, illustrated in two colors, points out advantages of manufacturer's pneumatic conveying systems.

Bul G-2 is issued by Fuller Co., Dept. CP, Catasauqua, Pa. When inquiring specify CP 5111 opposite last page.

A Completely New and Different PAYLOADER®

...years ahead in design, construction and performance !

the NEW HA

Thirty four years of pioneering experience by the manufacturer who has produced more complete tractor-shovel units than all others put together . . . more than three years of development and field-testing . . . this new HA model may well set new standards of mobile bulk materials handling performance for industrial operations.

...actual performance records prove amazing superiority!

carrying capacity?
TWICE AS MUCH as previous HA model; more than any other comparable size.

lifting capacity?
MORE THAN TWICE AS MUCH as previous; more than any other comparable size.

digging capacity?
MORE THAN TWICE AS MUCH as previous; more than any other comparable size.

bucket capacity?
16-2/3% INCREASE in (struck) capacity; 18 cubic feet PAYLOAD (heaped) capacity.

dumping height?
18 PERCENT INCREASE in maximum dumping height over previous "HA" PAYLOADER model.

turning radius?
SHORTER TURNING RADIUS than before with no increase in width, height or wheelbase.

safety features?
SETS NEW STANDARDS of safety in load carrying and driver protection.

production output?
INCREASED 50 TO 100% over previous model; more than any other comparable size.

accessibility?
IMPROVED EASE OF ACCESSIBILITY of all service points for better maintenance.

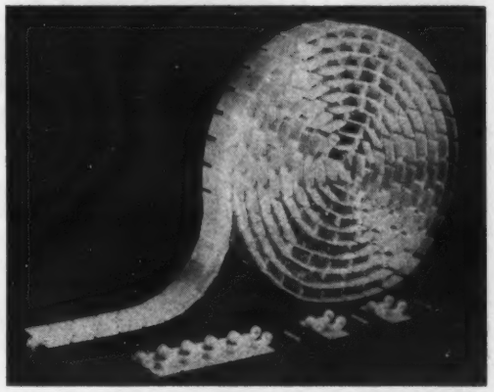
other features?
BREAKOUT BUCKET ACTION with 40° TIPBACK; sealed brakes; improved steering; new solenoid starting controls; new ignition lock; hydraulic accumulator; sealed and pressurized hydraulic tank; double-acting rams; torque converter; improved bucket construction; dustproof distributor; hose connectors; sealed grease fittings; new pin lock design; improved ground clearance; increased drawbar pull; chrome-plated piston rods; new parking brake and many others. Send for new specification catalog.

PAYLOADER®
THE FRANK G. HOUGH CO. LIBERTYVILLE, ILL.
SUBSIDIARY—INTERNATIONAL HARVESTER COMPANY

Send me full information on the new Model HA
Name .....
Title .....
Company .....
Street .....
City ..... State .....

When inquiring check CP 5112 opposite last page

Need for lubrication eliminated with flat top conveyor belt made of nylon resin



Conveyor chain is made entirely of nylon resin

Uses: For canning and bottling conveyor lines where corrosion resistance is required.

Features: Nylon conveyor chain needs no lubrication, reduces amount of power required for operation through low coefficient of friction and low weight.

Description: In addition to being resistant to food acids, alkalis, and brine solutions, links molded of Zytel nylon resin can be steam sterilized. No lubrication is required, thus product contamination is eliminated.

Conveyor chain of nylon resin handles over ½ million cans of beer every 8 hours

Use of only two elements — links and pins—makes assembly easy. Pins provide safety factor since they are designed to break in case of jamming. New links can be inserted in less than a minute.

Chains are available in link widths of 3¼ and 4½". They are intended for regularly-spaced ways of 1-11/16 and 1-¾" widths.

(Nylite chain is a product of Fenco, Inc., 125 N. Racine Ave., Chicago, Ill. . . . or for more information check CP 5113 on handy form opposite last page.)

Owner: Bridgep Brass Company

Engineers and Principal Builders: The H. K. Ferguson Company

Type of Installation: Acid-Proof Membrane and Brick Foundation for Copper Pickling Tanks.

SPECIFICATIONS

1. Inspect concrete surfaces for honeycomb. Make necessary repairs, prime required area with one coat Ceilcote Primecote No. 83P.

2. Apply ¼" Ceilcote Hot Mastic bituminous base acid-proof membrane in two coats to the specified areas.

Acid-Proof Brick — First quality acid-proof shale, 8" x 3¾" x 2¼" laid on floors and walls.

Acid-Proof Cement — Corobond furfuryl alcohol resin base with carbonaceous filler. Brick set in ⅛" bed Corobond.

On this installation, Ceilcote services consisted of materials, supervision, labor and equipment . . . on a guaranteed basis. The working properties of Ceilcote Corobond plus experienced brick masons made the neat appearance in all joints, both on the floors and piers, possible. Joints are filled and bricks remain in place even on sloping floors . . . allowing accuracy to ⅛" tolerance on the height of piers.

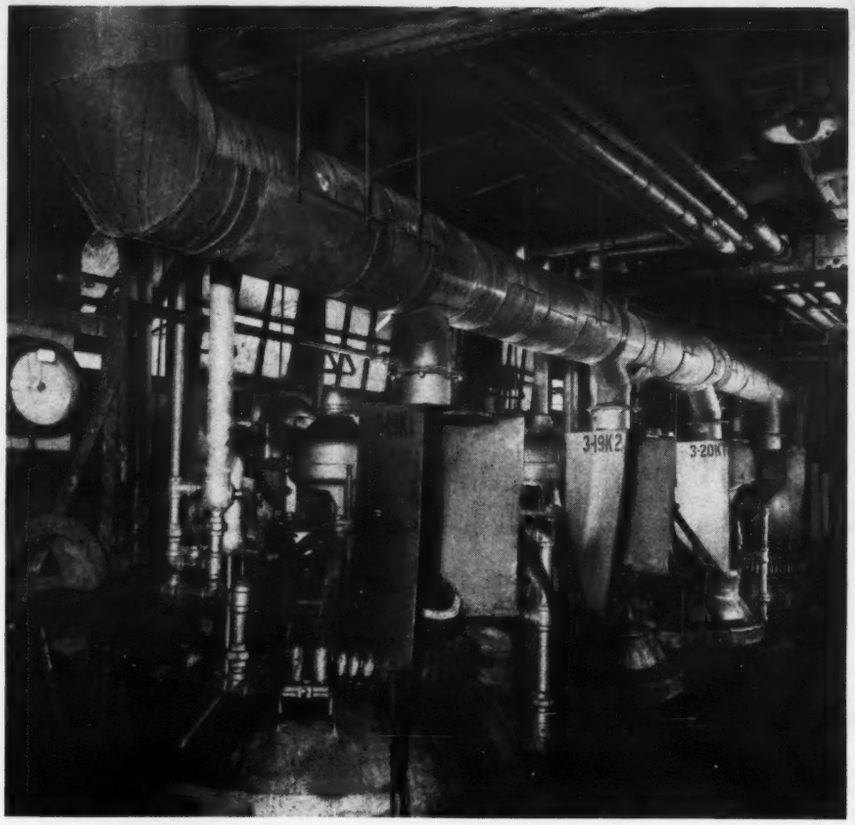
The Ceilcote Company is equipped to contract for an entire installation or for labor or materials only. We welcome the opportunity of studying your individual coating needs so that the best material for the job may be recommended.

3022-CC

Write today for new 4-page Catalog giving complete information on corrosion-proof services and products of the Ceilcote Co.

THE CEILCOTE COMPANY
CORROSION-PROOF MATERIAL AND CONSTRUCTION
4834 RIDGE ROAD • CLEVELAND, OHIO

When inquiring check CP 5114 opposite last page



Polyvinyl chloride duct work above vat dye kettles —

vents corrosive vapors

No maintenance has been necessary on plastic duct system since its installation more than a year ago

Problem: Although installation cost of painted black iron fume ducts used at the American Cyanamid Company's Bound Brook, N. J. plant was low, maintenance was very high. Duct work made up a manhole ventilating system on a battery of (enamel-lined) reaction kettles used in the manufacture of vat dyes. Hydrochloric acid and organic solvent* vapors were handled in the kettles and by the ventilating system. Temperature of the vapors averaged 70°F.

Solution: In August 1953, Boltaron 6200 polyvinyl chloride plastic ducts were placed in service handling the corrosive vapors.

Results: Present duct work has required no maintenance and is still in good condition after more than a year of service.

(Boltaron 6200 is a product of H. N. Hartwell & Son, Inc., Dept. CP, Park Square Bldg., Boston 16, Mass. . . . or check CP 5115 on handy form opposite last page.)

(Ducts were fabricated by Plastichem, Inc., Dept. CP, 170 Fifth Ave., Hawthorne, N. J. . . . or for more information check CP 5115A on handy form opposite last page.)

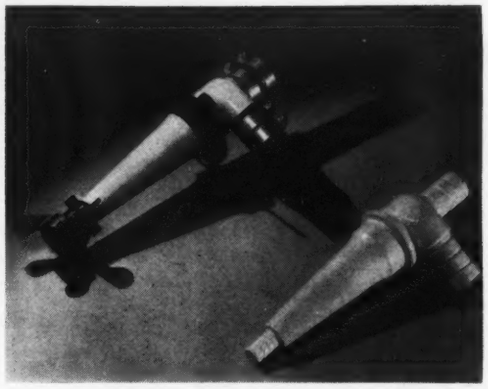
*Boltaron 6200 should be tested prior to use in organic solvent applications.

Hot or corrosive feed handled by porcelain cyclone

unit is capable of separations in the 10 to 20 micron range on non-abrasive, fine feed

Uses: With chemical, metallurgical, and non-metallic classification problems requiring heat- and corrosion-resistant materials of construction.

Features: Constructed completely of porcelain with a cone 50 mm in diameter, wet cyclone is capable of separations in the 10 to 20 micron range on non-abrasive, relatively fine feed.



Cast porcelain separator shown with and without fittings

Description: Cyclone separator, called the Type P50 DorrClone, is approximately 18" in length and has a cone angle of 10°. It will operate at pressures up to 80 psi with a maximum flow of 30 gpm. When pressure is reduced to only 5 psi, flow is decreased to 7.5 gpm. Feed chamber, vortex finder, and cone section are all integral parts of cast porcelain body which is completely glazed with exception of feed and product connections. Each unit comes equipped with a steel support ring, rubber disc apex valve, and hose and clamps for feed and overflow connections.

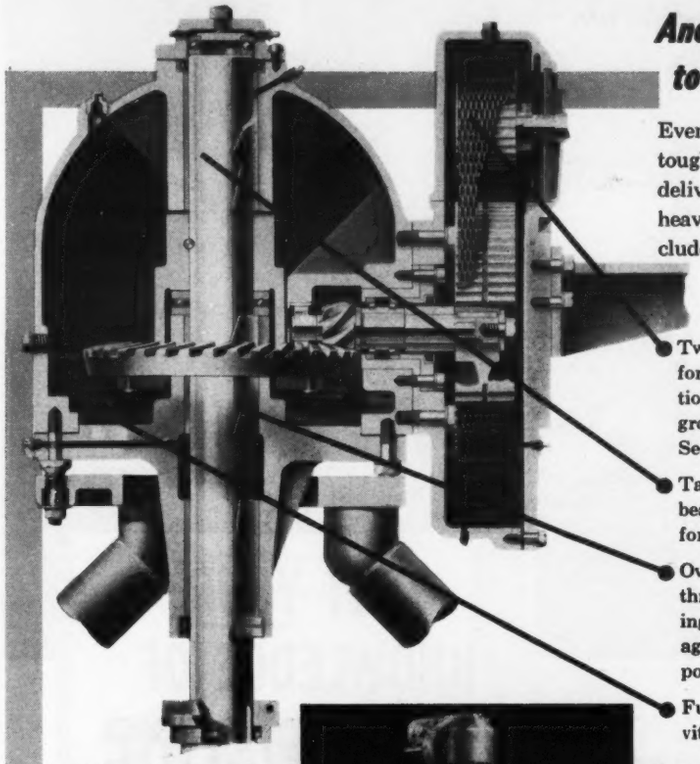
(Cyclone separator is a product of Dorr-Oliver, Inc., Dept. CP, Barry Place, Stamford, Conn. . . . or for more information check CP 5116 on handy form opposite last page.)

For ways to whip corrosion . . .

. . . try the handy Product Directory (starting this issue on page 217). You'll find it an easy "page-locator" for ideas, materials, and services.

Glascote reactors give you drives that

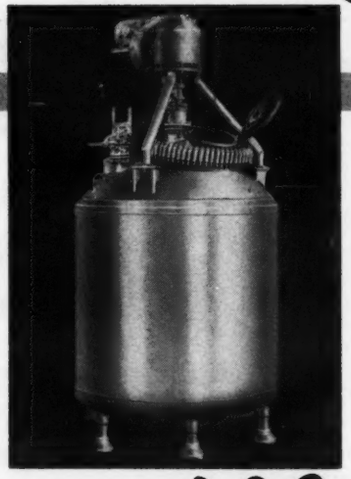
excel in heavy-duty operation



Another good reason why it pays to do business with Glascote

Every unit in Glascote's complete line of tough, precision-engineered drives is built to deliver remarkable dependability in your heavy-duty applications. These drives include V-belt types for laboratory reactors . . . variable-speed and gear-head motor drives.

- Two drive reductions transmit ample power for all agitator needs and speeds. First reduction is accomplished by hardened, precision-ground, spiral-bevel pinion and ring gears. Second is made by silent chain or helical gear.
- Tapered roller bearing and a radial roller bearing assure friction-free straddle-mounting for pinion shaft.
- Oversize vertical sleeve bushing and ball thrust bearing support the ring gear, mounting and agitator shaft. Positive alignment for agitator shaft assured by bushings at three points.
- Full bath lubrication means long life for all vital parts.



Equipped with dependable drives, Glascote reactors are available in a selection of sizes for laboratory, pilot plant and production applications. Your choice of glass-lined or alloy metals.

Ask the representative who calls on you for all the facts about Glascote products—reactors, receivers, condensers, evaporators, storage tanks and accessory products. Or, if you prefer, write direct. Glascote Products, Inc., Cleveland, 17, a subsidiary of A. O. Smith.

Glascote

PRODUCTS, INC.

CLEVELAND 17, OHIO

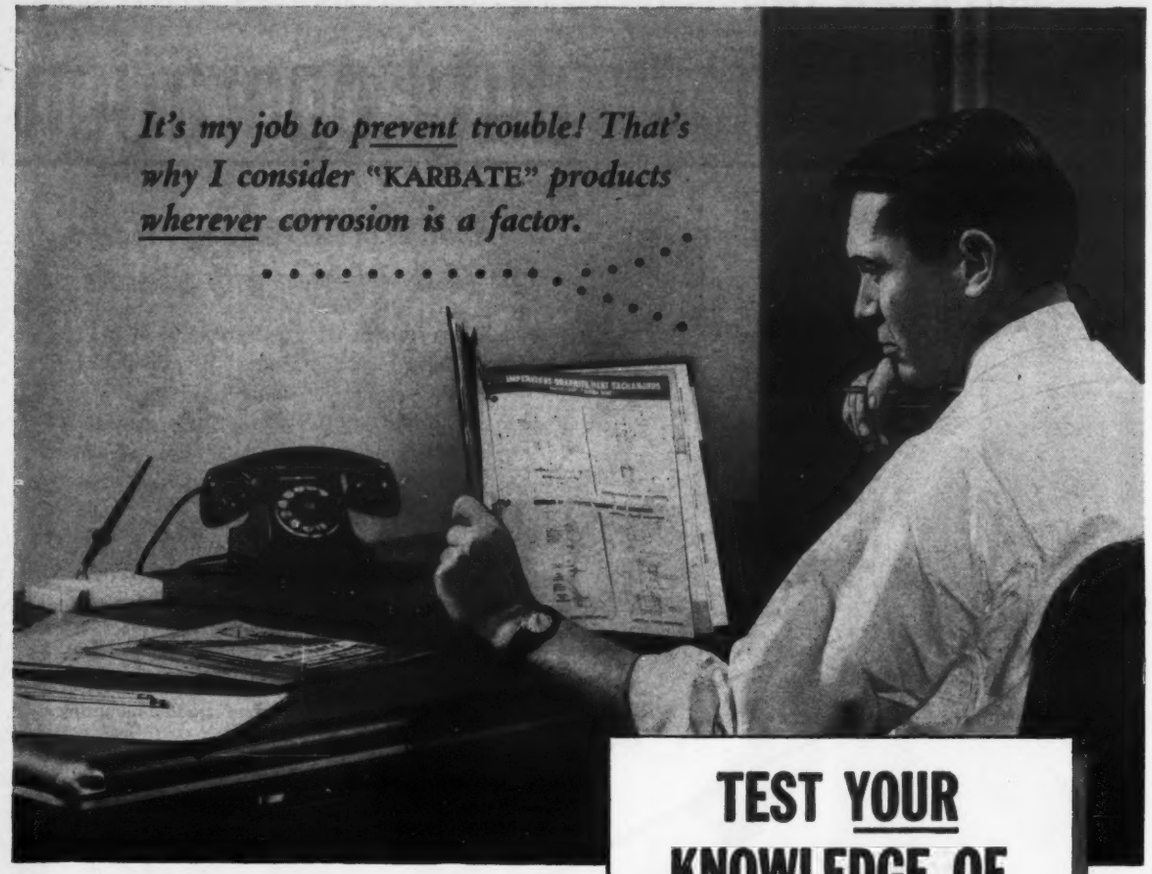
Sales offices or agents in Principal Cities

Export Sales:
A. O. Smith Corp., International Division, Milwaukee 1, Wisconsin

A subsidiary of **A.O.Smith** Corporation

World's largest manufacturer of glass-lined steel products

When inquiring check CP 5117 opposite last page



TEST YOUR KNOWLEDGE OF KARBATE BRAND IMPERVIOUS GRAPHITE EQUIPMENT

Do You Know...

- ... that "Karbate" impervious graphite is inert to a greater range of corrosive conditions than any other widely used material of construction?
- ... that the price of "Karbate" equipment compares favorably with those of less corrosion-resistant materials?
- ... that standard designs of "Karbate" equipment take full advantage of this material's high compressive strength to assure ruggedness beyond the toughest service requirements?
- ... that "Karbate" brand impervious graphite – the original and most widely used brand–is manufactured exclusively by National Carbon Company?

Don't wait until other materials fail – consider "Karbate" impervious graphite equipment *right from the start* when building a new plant or expanding present facilities. Our technical and engineering staffs are at your service.

The term "Karbate" is a registered trade-mark of Union Carbide and Carbon Corporation

NATIONAL CARBON COMPANY

A Division of Union Carbide and Carbon Corporation
30 East 42nd Street, New York 17, N. Y.

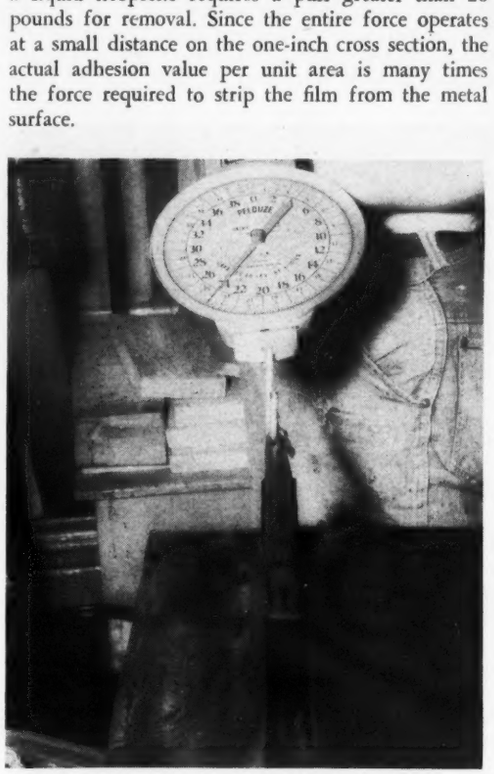
Sales Offices: Atlanta, Chicago, Dallas, Kansas City, Los Angeles, New York, Pittsburgh, San Francisco
IN CANADA: Union Carbide Canada Limited, Toronto

When inquiring check CP 5118 opposite last page

Adhesion of neoprene coatings to properly prepared surfaces is higher than 20 ppi . . .

have excellent resistance to aliphatic solvents and variety of corrosives

In recent laboratory tests, neoprene coatings were shown to have excellent adhesion. When applied over a chlorinated rubber base primer on a sand-blasted steel surface, a one-inch strip deposited from a liquid neoprene requires a pull greater than 20 pounds for removal. Since the entire force operates at a small distance on the one-inch cross section, the actual adhesion value per unit area is many times the force required to strip the film from the metal surface.



Adhesion test on a one-inch wide strip of neoprene shows a pull of about 24 lb on the small cross-section as indicated on scale above

Another advantage of neoprene coatings is their overall chemical resistance. Coatings are not attacked by most aliphatic solvents, water, solutions of most salts, inorganic alkalis, and non-oxidizing acids such as dilute sulfuric, phosphoric, and hydrochloric acids at temperatures up to 200°F. Neoprene films are attacked by oxidizing agents such as concentrated sulfuric and nitric. Neoprene is permeable to but not attacked by concentrated halogen acids such as hydrochloric and hydrofluoric.

For protection against abrasion or splash or fumes from highly corrosive liquids, a two-package, on-the-job compounded neoprene is recommended. In some instances, the low solids one-package coating may be used. Properly compounded neoprene coatings can be

applied by spray or brush to yield films at least 1.5 and 3 mils thick respectively. Specially compounded high solids coatings may be brush-applied in thicknesses ranging from 15 to 20 mils.

A considerable volume of data on case history studies of neoprene coatings has been assembled. In one typical case, ductwork exposed to both corrosive acids and traces of solvents in a chemical plant was coated with 60 mils of a standard neoprene coating. After eight years, building was torn down and lining was found to be in perfect condition. Other case histories illustrate resistance to caustic, sulfuric acid fumes, and other corrosives.

(Condensed from technical paper, "Laboratory and Plant Evaluations of Liquid Neoprene Coatings," by R. B. Seymour, Atlas Mineral Products Co. Paper was published in Corrosion, Vol 10, No. 4, April 1954, pages 116-121.)

(For further information on neoprene coatings contact The Atlas Mineral Products Company, Dept. CP, Mertztown, Pa. Check CP 5119, opposite last page.)

Nickel found to be best material, of those tested, for handling molten sodium hydroxide . . .

under specified conditions, metal can be used successfully at 1500°F

In recent research work, nickel was found to be better than any other material, of those investigated, for handling molten sodium hydroxide. Even usefulness of nickel is severely hampered at high temperatures by occurrence of corrosion and mass transfer whenever a temperature difference is present in system. However, study showed that nickel can be used with a great degree of success in static or free convection systems with small temperature variations, especially if a hydrogen atmosphere can be tolerated.

No additive, with the exception of hydrogen, resulted in a decrease in mass transfer rate in test conducted with a temperature gradient and under flow conditions. Sodium aluminate and calcium hydride were effective in reducing transfer in the static experiment, although they did not reduce transfer with 15 feet per sec flow.

Chemical composition of both the caustic and the nickel was found to be important. Concentrations of sodium carbonate in the sodium hydroxide above 1% increased the mass transfer rate.

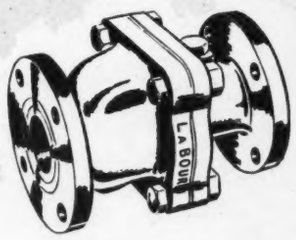
(Condensed from technical paper, "A Study of Corrosion and Mass Transfer of Nickel by Molten Sodium Hydroxide," by Robert A. Lad and Sidney I. Simon, of the National Advisory Committee for Aeronautics, Lewis Laboratory, 1512 H St., N. W., Washington 25, D.C. Paper was presented at the 1954 annual meeting of the National Association of Corrosion Engineers in Kansas City, Mo.)

LaBOUR

introduces a new line of valves for handling chemicals

The ruggedness, quality, and low maintenance costs for which LaBour pumps have long been famous in the chemical industry are now available in a family of globe and check valves. Like LaBour pumps, these new valves have been designed specifically for the chemical industry—they are not merely corrosion resistant.

Available in a variety of alloys to meet requirements and in sizes from 1" and up, LaBour valves incorporate features which extend their service life and make maintenance easy. Send for bulletins H-1 and H-2.



Check valves as well as globe valves are included in this newly created series. Check valves may be mounted either horizontally or vertically without internal change.

ORIGINAL MANUFACTURERS OF THE SELF-PRIMING CENTRIFUGAL PUMP

LaBOUR VALVES

THE LaBOUR COMPANY, INC. ★ ELKHART, INDIANA, U.S.A.

When inquiring check CP 5120 opposite last page

Protection from corrosion provided by application of plastic paint . . .

vinyl coating has high degree of chemical inertness

Uses: For corrosive applications.

Features: Coating is chemically inert, giving excellent protection against the corrosive effects of marine atmospheres, salt water, sewage, acids, alkalis, oils, industrial wastes, and numerous other materials.

Description: Plastic paint consists of vinyl resins blended with plasticizers and high-boiling point solvents. Usual system recommended has three components, a primer, a tiecoat, and a top coat. In addition to resisting corrosion, coating withstands abrasion and erosion. It seals out moisture, retards fire, and dries to an odorless film.

(Corrosite plastic paint is product of Reliance Paint Co., Inc., Dept. CP, 64 S. 6th St., Brooklyn 11, N. Y. . . . or for more information reader may simply check CP 5121 on handy form opposite last page.)

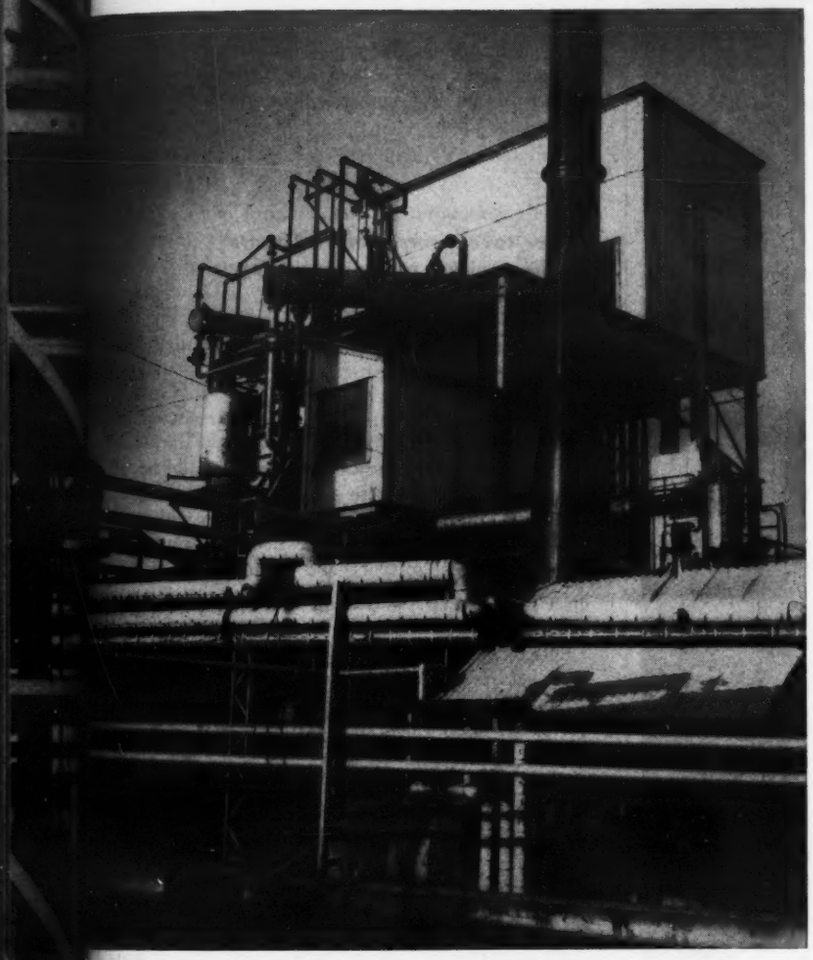
Repair of linings is fast with rubber patch . . .

on pickling machinery, patches stay in good condition

One hazard encountered in strip pickling machinery is breakdown of rubber lining, and subsequent downtime for patching and repair. Time loss can be minimized by application of a patch made of high temperature and acid-reistant rubber compound. After damaged lining of strip mill lid has been prepared, patch is cut to size and applied. It cures itself after a few hours exposure to heat of bath, which is usually H_2SO_4 at approx 200°F.

Assuming a damaged area of 100 sq ft, a repair job can be completed and the unit back in operation in eight hours. Patches thus applied

USES STAINLESS STEEL
to maintain purity and top quality



Manufacture of synthetic resins and industrial chemicals at Reichhold Chemicals, Inc., Elizabeth, N. J., requires utmost attention to quality and product purity. That's why Stainless Steel is the key material for equipment all the way down the line.

Processing of alkyd phenolic acid and urea resins takes place in Stainless Steel reactors ranging in size from 2500 to 7800 gallons capacity. Weigh tanks, gravity feed lines, pumps, scrubbers and heat exchangers that serve the reactors are Stainless Steel, too.

Not only does Stainless Steel serve as the most satisfactory material for prevention of corrosion, erosion, cavitation and roughness in equipment, but it makes plant housekeeping easier. Stainless is a clean material that stays clean.

Stainless Steel's unique combination of properties makes it the most satisfactory construction material for the widest variety of chemical processing operations. Examine your operations and let Stainless take over the critical, difficult jobs. When you do, be sure you get service-tested USS Stainless Steel.

00-gallon Stainless Steel reactor at Reichhold Chemicals, Inc., Elizabeth, N. J., is housed in this structure. Two Stainless Steel heat exchangers atop e building and much Stainless Steel piping serve it.

nother view of the 7800-gallon reactor. It is in service 12-20 hours a day, days a week, and was fabricated by Steel Alloy & Tank Company, Newark, N. J.

UNITED STATES STEEL CORPORATION, PITTSBURGH
AMERICAN STEEL & WIRE DIVISION, CLEVELAND
COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO
NATIONAL TUBE DIVISION, PITTSBURGH
TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA.
UNITED STATES STEEL SUPPLY DIVISION
WAREHOUSE DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

See "THE UNITED STATES STEEL HOUR"—Televised alternate weeks—Consult your newspaper for time and station.

USS STAINLESS STEEL

USS

SHEETS · STRIP · PLATES · BARS · BILLETS · PIPE · TUBES · WIRE · SPECIAL SECTIONS

UNITED STATES STEEL

remain in excellent condition for long periods of time.

A more economical method of repairing strip mill lids is to fabricate extra lids which can be lined in the shop at about half the cost, and exchanged as other lids deteriorate. This way, downtime is minimized.

(Rubber lining repair, fabrication and lining of extra lids to specifications are services of Protective Coatings Div., Metalweld, Inc., Dept. CP, Scotts Lane & Abbotsford Ave., Philadelphia 29, Pa. . . . check CP 5122 opposite last page.)

Has strength of concrete 10 min after pouring . . .

many corrosives resisted by sulfur cement

Uses: For jointing corrosion-resistant brick or other ceramic structures.

Features: Ten minutes after pouring, chemical-resistant cement is essentially as strong as concrete is after 30 days curing. Cement exceeds requirements of ASTM Spec C 287-52T.

Description: Chemical-resistant cement, called Vitrobond, is a hot-poured plasticized sulfur cement. It contains at least 55% refined sulfur completely soluble in carbon disulfide and present primarily in the rhombic form. Material has a water absorption of less than 0.6% by weight, a tensile strength of not less than 500 psi when measured at any temperature in the range of 40 to 100°F. Coefficient of expansion is not greater than 1×10^{-5} in/in/°F.

(Chemical-resistant cement is a product of The Atlas Mineral Products Company, Dept. CP, 26 Walnut St., Mertztown, Pa. . . . check CP 5123 opposite last page.)

For more information on product at left, specify CP 5124 . . . see information request blank opposite last page.

JENKINS REGRIND-RENEW
PLUG TYPE VALVES
WITH
500 BRINELL
Armor Seat
Armored against valve-killing close control of steam . . . and abrasion
Plug and seat ring are Jenkins JX500, a stainless chromium alloy steel made to Jenkins high strength specifications, heat-treated to 500 Brinell hardness. Seating surfaces are super-hard and mirror-smooth, offer highest resistance to galling, cutting, abrasion, and erosion . . . and "wire drawing" effects of close regulation of steam.
300 lb. 200 lb. 150 lb.
Globe and Angle
SOLD THROUGH LEADING DISTRIBUTORS
Call your Jenkins Valve Distributor, and ask for Form 202, or write: Jenkins Bros., 100 Park Avenue, New York 17.
JENKINS VALVES
SINCE 1864
LOOK FOR THE JENKINS DIAMOND
Jenkins Bros

When inquiring check CP 5125 opposite last page

CORROSION CONTROL

Titanium research reports

More than 300 research reports on titanium are described and priced in twenty-six page volume. Special listings are featured for titanium alloys, titanium carbides, titanium nitrides, and the various titanium oxides. Research described in these reports covers all characteristics of the metal — physical, chemical, and electrical.

Titanium Bibliography (CTR-306) is available at 50c a copy from The Office of Technical Services, U. S. Dept. of Commerce, Room 6227, Washington 25, D. C.

Paper covers corrosion resistance of cupro-nickel alloys containing 10 to 30% nickel . . .

resist water, ammonia, alkalis, organics, solvents, and sulfuric acid

In a recent technical paper, the corrosion resistance of cupro-nickel alloys containing 10 to 30% nickel is discussed. Although advantage has been taken of resistance of the alloys to salt water for some time, more recently they have come into use to withstand the effects of water other than salt water, ammonia, alkalis, organics, solvents, and sulfuric acid.

In a boiler feedwater treating system, specimens exposed to water at 120-150°F for 65 days suffered negligible corrosion. Alloys are also used at high temperatures due to their superiority in maintaining strength over other copper alloys, without excessive corrosion. Specimens exposed for 64 days at outlet side of a feedwater heater operated at 1000 psi at 388°F had corrosion rates to 0.1 to 0.2 mils per year.

Cupro-nickel alloys are superior to other copper-base alloys in resisting attack by ammonia and ammoniacal compounds. Resistance to amine solutions is good where conditions are strongly reducing. Specimens of 70/30 cupro-nickel exposed for 100 days in a monoethanolamine stripping tower at 180 to 220°F were corroded at a rate of only 1.9 mils per year with no pitting. Corrosion can become quite severe, however, in the presence of oxygen or hydrogen sulfide.

The 70/30 cupro-nickel alloy has been used successfully as tubes in evaporators for concentrating caustic soda to about 50% where copper pickup by caustic could not be tolerated. In the treatment of lignosulfonic acids with caustic soda in the manufacture of vanillin, specimens of 70/30 cupro-nickel exposed in an evaporator at 212°F for 502 hours corroded at a rate of only 0.4 mils per year. Corrosion in caustic solutions may be aggravated by the presence of sulfur compounds.

As might be expected, cupro-nickel alloys offer good resistance to attack by various organic compounds, with the exception of petroleum products containing

hydrogen sulfide. Even with the latter, cupro nickels are sometimes chosen because corrosion is not severe at moderate temperatures and advantage of good performance on cooling water side is obtained.

Ordinarily, the cupro-nickels demonstrate good resistance to attack by chlorinated solvents. However, there may be some exceptions in the case of carbon tetrachloride. Sulfuric acid is resisted very well by cupro-nickel alloys.

(Condensed from paper, "Corrosion Resistance of Cupro Nickel Alloys Containing 10 to 30% Nickel," by F. L. LaQue, The International Nickel Company, Inc. Paper was presented at the 1954 annual meeting of the National Association of Corrosion Engineers in Kansas City, Mo.)

(For more information on cupro-nickel alloys containing 10 to 30% nickel contact The International Nickel Co., Inc., Dept. CP, 67 Wall St., New York 5, N. Y. . . . or for more information check CP 5126 on handy form opposite last page.)

Two Teflon piston rings combine for tough piston seal . . .

suitable for applications where small amounts of leakage are allowable

Uses: Suitable for piston applications where very small amounts of leakage are allowable.

Features: Pressure-responsive seal is tough, inert, and corrosion-resistant — being made of Teflon. It is compact, compensates to bore irregularities, and has little shift during pressure reversal. Friction at all pressures is low.

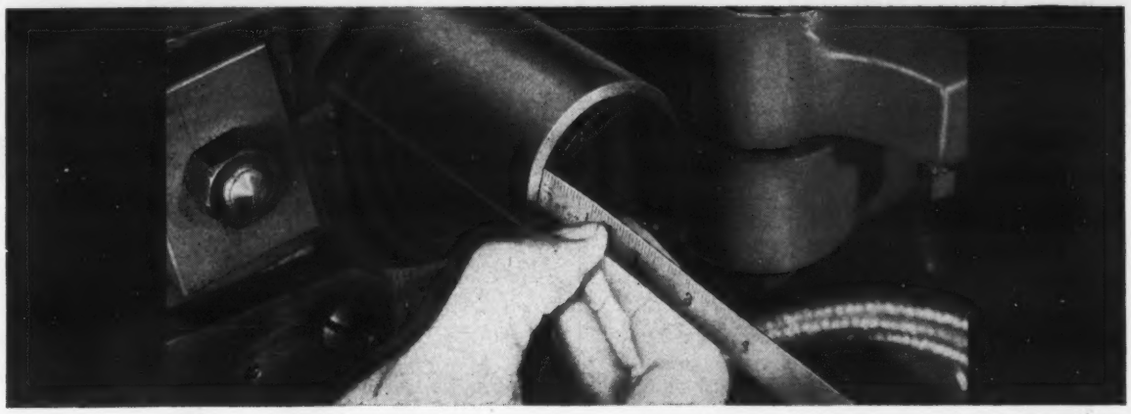
Description: Seal is known as the BW Series S-11052 dual piston ring seal and is available in nominal standard sizes from 1 to 4" OD. Operating temperatures range from −100°F to plus 300°F at pressures up to 5000 psi.

Seal combines two identical Teflon piston rings with stepped sliding joints, staggered to form a continuous seal, and a mechanical expander ring. Joint arrangement allows for dimensional changes due to heat and pressure.

If desired, a stainless steel pin can be supplied which, recessed in bottom of piston groove, engages grooves in seal to eliminate possibility of coincidence of seal joints resulting from relative rotation of piston ring seals. Expander ring provides a radial force on rings for effective low-pressure sealing. Groove fabrication and seal installation are easily accomplished.

(Hydraulic piston seal is a product of Dept. H., W. S. Shamban & Co., Dept CP, 11617 W. Jefferson Blvd., Culver City, Calif. . . . or check CP 5127 on handy form opposite last page.)

DOW



You Can See Why

SARAN LINED PIPE

CUTS CORROSION COSTS

Corrosion resistant Saran Pipe swaged into steel is your answer to downtime losses.

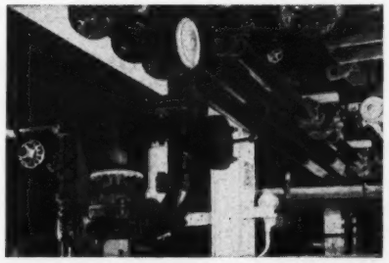
Saran lined pipe, fittings and valves are built to convey acids, alkalies and other corrosive liquids at low over-all costs. The durable inner lining eliminates shutdowns due to corrosion and forms snug, tight-fitting joints that prevent leakage.

Saran lined pipes, fittings, and valves are easily and inexpensively installed. They are cut and threaded in the field with any standard pipe fitter's tools. Because of saran lined pipe's rigidity, even long spans require a minimum of support.

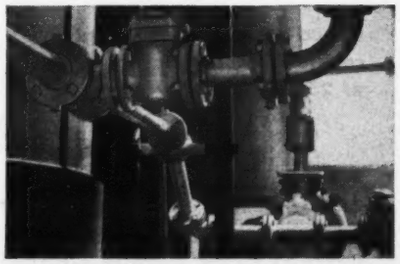
If your operation requires the conveying of corrosive liquids, and if downtime losses are troubling you, investigate saran lined pipe, fittings, and valves today. For further information, contact the Saran Lined Pipe Company, 2415 Burdette Avenue, Ferndale 20, Mich., Dept. 526B-1.

RELATED SARAN PRODUCTS—Saran rubber tank lining • Saran rubber molding stock • Saran tubing and fittings • Saran pipe and fittings.

SOME OF THE MANY INSTALLATIONS USING SARAN LINED STEEL PIPE



A large chemical company uses this installation to convey demineralized water. It has a perfect record of keeping the water free of contamination for five years!



Saran lined pipe used for conveying hydrochloric acid at temperatures from 20° to 90°C., has had no unscheduled interruptions due to corrosion for over two years!

you can depend on DOW PLASTICS DOW

When inquiring check CP 5128 opposite last page

Wrought iron pipe still sound after decade of attack by corrosives . . .

used for dry sprinkler system in dye room to combat salt-laden atmosphere

For more than ten years wrought iron pipe, installed in dry sprinkler lines at Hampden Color & Chemical Company, Springfield, Mass., has proved remarkably resistant to salt water attack. The piping, first installed in 1941 and in greater quantity in 1943, is still in service.

Failures in the dry sprinkler lines used previously had been occasioned primarily by outside corrosion of the pipe, resulting from a combination of condensation and dye dust containing a large percentage of salt. Salt, settling on lines that are always wet, create a weak "salt bath" that is harmful to many ferrous metals.

To overcome this problem, effect lower maintenance costs, and obtain the higher efficiency that flows from continuous plant operation, it was decided to replace existing dry sprinkler lines with wrought iron piping. Wrought iron was chosen because of its two-component structure, high purity iron and iron silicate — a glass-like slag.

Slightly higher first cost of wrought iron, compared with that of original piping, has long since been equalized by providing extended service life and lower cost-per-year maintenance. As a consequence of its economical performance in the dry sprinkler system, wrought iron is now used by the company for corrosion protection in other applications. These include domestic water lines, boiling tanks in which metal is in direct contact with aluminum sulfate and, more recently, in a smokestack.

(Wrought iron piping is a product of A. M. Byers Company, Dept. CP, 16th Floor, Clark Bldg., Pittsburgh 22, Pa. . . . or for more information check CP 5129 on handy form opposite last page.)

Baked epoxy resin coating resists 73% caustic at 250°F . . .

material is used as lining for tank cars used to ship corrosives

A baked Epon coating is being successfully used as a lining in tank cars carrying 73% caustic soda loaded at a temperature of 250°F. Previous coatings were not suitable for the high pH ranges (10-14).

Other cars lined with the baked epoxy resin coating are being used for the shipment of liquid latex. Former coatings would fail under the highly alkaline conditions and in order to ship the latex

WHEN FLUIDS ARE

TOO ROUGH

Get the Certain Protection of KEL-F® Plastic

KEL-F Plastic can supply many of the answers to plant equipment corrosion problems. This fluorocarbon plastic is inert to virtually all chemical attack—including mineral acids, oxidizing agents as well as strong caustics.

HIGH COMPRESSIVE STRENGTH

KEL-F Plastic is outstanding for its resiliency and resistance to cold flow. Ring seals and gaskets molded of KEL-F Plastic exhibit a low percentage of deformation under load—retaining seals longer and more effectively.

RESISTANCE TO HEAT AND COLD

KEL-F Plastic has unusually high resistance to temperature extremes—exhibits satisfactory properties over a temperature range of approximately 710° F. (–320° F. to 390° F.)

NON-ADHESIVE

The non-adhesive properties of KEL-F Plastic are particularly advantageous in the handling of viscous fluids, and in maintaining clean, unclogged lines and equipment.

MOLDABILITY

KEL-F Plastic is readily molded—by injection compression or extrusion. Its dimensional stability and low mold shrinkage make it ideally suited to molding with metal. The techniques of molding this fluorocarbon have been fully developed, and perfected. Today, KEL-F Plastic parts and products are produced in volume by molders throughout the country.

Modern processing methods demand plant equipment with greater resistance to corrosion, temperature extremes and higher pressures. The weak links in such equipment are the valves, gaskets and seals. KEL-F Plastic is providing the solution to many of these problems, and producing demonstrable results in reduced downtime and lowered maintenance costs. It is available as a molding compound, or it can be obtained in rods, tubing, sheets and film from a number of suppliers. It is also available in dispersions, suitable for bake-coating on metals and certain non-metals. The full story of KEL-F Polymer should be in your active file. Write us.

®Registered trademark of The M. W. Kellogg Company's fluorocarbon polymers.

KELLOGG

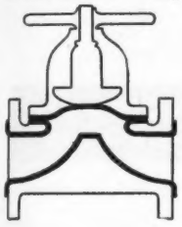
THE M. W. KELLOGG COMPANY

Chemical Manufacturing Division, P. O. Box 469, Jersey City, N. J.

SUBSIDIARY OF PULLMAN INCORPORATED

H FOR METAL!

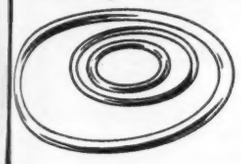
in Valve Linings



Valve Diaphragms

Gaskets

O-Ring Seals



When inquiring check CP 5130 opposite last page

Lining in cars is baked by means of hot air furnaces, equipped with centrifugal blowers to carry heated air through car domes

it was necessary to limit the pH to a maximum of 10.4, thus adding to manufacturing costs.

The baked coating is applied to tank car interiors on previously sandblasted surfaces by spraying. Each coat is individually baked for about two hours at a metal temperature of about 175°F. Usual application consists of six coats giving a final film thickness of about 5 mils. After the final coat has been applied, a final bake at a metal temperature of approximately 375°F is run for two hours to knit all the coats into one cured film. About three hours is required to bring the steel up to this temperature. Various baking temperatures are brought about with the use of gas-fired hot air furnaces, piping the hot air through the dome of the tank car.

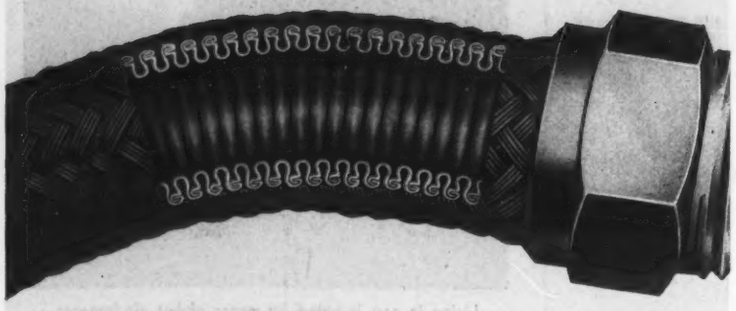
(Base material in coatings, Epon® resins, is a product of Shell Chemical Corp., Dept. CP, 50 W. 50th St., New York 20, N. Y. . . . or for more information check CP 5131 on handy form opposite last page.)

(Coatings were formulated and applied by Lithcote Corp., Dept. CP, 333 W. 40th Pl., Chicago 9, Ill. . . . or for more information check CP 5131A on handy form opposite last page.)

Formulations of red lead paints for galvanized steel

Red lead paint formulations for galvanized steel, whether rusted, weathered, or treated new, are given in eight-page technical bulletin. Formulas for both one coat applications and for application where a top coat is to be used are included.

"Red Lead Tech Letter No. 9" is issued by Red Lead Tech Committee, Lead Industries Assn., Dept. CP, 420 Lexington Ave., New York 17, N.Y. . . . or for more information reader may simply check CP 5132 on handy Reader Service slip opposite last page.



...to handle vibration, temperature and corrosion headaches in conveying applications

Do you have to conduct water, solutions, fuel, lubricants, oxygen or other gases or liquids between two points which may not remain fixed? Your answer is Titeflex flexible metal hose.

Titeflex offers you just about everything you could wish for in metal hose—seamed or seamless, braided or unbraided, a wide choice of alloys and fittings. And Titeflex has the originality and experience to simplify your design difficulties—the laboratory control and development engineering assistance you want behind you. All you have to do is send your drawing; we fill in the exact hose type required. ***Telephone or mail in the coupon for full information about metal hose and its uses, catalog 4200.***

Titeflex

FLEXIBLE METAL HOSE

TITEFLEX, INC.
Industrial Products Division
509 Hendee Street
Springfield, Mass.

Your knowledge af metal hose applications may be helpful to us. Please send your complete catalog—without obligation.

Name_____

Title_____

Firm_____

Address_____

City_____ **Zone**_____ **State**_____

When inquiring check CP 5133 opposite last page

Corrosion-proofing for industry

Comprehensive information on a complete line of corrosion-proof linings, bricks, cements, coatings, and mastic floors is presented in catalog. Materials have different chemical and physical properties that meet requirements of a wide range of applications. Corrosion-proofing services rendered by company are also outlined.

Cat G-201 is issued by Ceilcote Co., Dept. CP, 4834 Ridge Rd., Cleveland, Ohio. When inquiring reader may simply specify CP 5134 on handy form opposite last page.

Temperatures to 150°F, most acids resisted by pails . . .

good impact resistance shown by rubber products

Uses: Handling corrosives.

Features: Equipment is resistant to solutions of most acids, bases, salts, and organic materials at temperatures up to 150°F.

Description: Corrosion-resistant pails and dippers are molded from Stokolite L-44, a compound containing Good-rite Resin 50 (a product of B.F. Goodrich Chemical Co.), for high impact strength, rigidity, and excellent resistance to abrasion and chemicals.

Pail and dipper have good resistance to abrasion

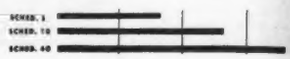
Be Wise! **LOOK AT ALL THREE when you need Stainless Pipe!**

To get the most economical stainless pipe for handling corrosive fluids, Schedules 5, 10 and 40 should be closely compared for: • initial cost • installed cost • ease of handling • flexibility of assembly • flow capacity • adequate allowable working pressure • effective corrosion resistance • service life.

Whichever Schedule is best for your service conditions, Carpenter makes it in sizes up to 4 inches and in all AISI stainless analyses . . . plus Carpenter Stainless No. 20 Cb, and Carpenter Alloys B and C for super corrosion resistance. Adequate stocks are as close as your local distributor. Call him for information on your stainless pipe problems and time-saving delivery.

...compared in cost

...compared in weight



Send for this handy Pipe Bending Chart.

THE CARPENTER STEEL COMPANY
Alloy Tube Division, Union, New Jersey

When inquiring check CP 5135 opposite last page

Complete records of: Areas painted; Dates; Brands used; Quantities; Costs; Durability

KNOW YOUR PAINT COSTS
FREE BOOK
makes it easy!

Put your industrial maintenance painting on a business-like, cost-and-performance basis. With this free, file-size, 24-page record book it's easy to have a complete history of every painting job on buildings and equipment for years to come. No more guesswork. It becomes your guide to better painting—and saving money! *Your business letterhead request brings your free copy, without obligation. Write today!*

TROPICAL PAINT COMPANY
1128-1288 W. 70th • Cleveland 2, Ohio
HEAVY-DUTY MAINTENANCE PAINTS SINCE 1883

When inquiring check CP 5136 opposite last page

Want to forget about rust for 20 years?

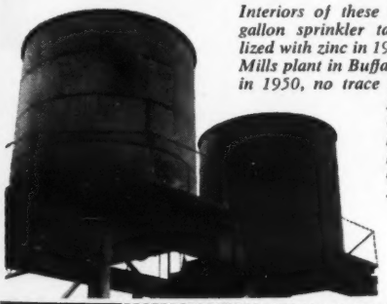
Pure zinc or aluminum, molten-sprayed on iron or steel surfaces, provides positive, dependable protection against atmospheric corrosion for upwards of 20 years without *any* further maintenance.

These unique coatings are *mechanically* bonded to the surface—adhesion is *not* dependent on volatile vehicles or binders. Scaling, crazing, blisters are eliminated. Protection is *positive*. "Metallize 'em and forget 'em!"

Why not find out more about how you can forget about rust on iron and steel structures and equipment—eliminate the nuisance and expense of constant painting and repainting? Write for descriptive Bulletin 62-B—it's free.

the Metco Systems*

—a series of 18 basic engineering specifications developed over 19 years of experience with pure zinc and aluminum coatings on many different types of structures and equipment in a wide range of corrosive conditions. The *Metco Systems* provide for standardization of surface preparation, coating thicknesses and organic aftercoatings for various surface conditions and appearance requirements.



Interiors of these two steel 15,000 gallon sprinkler tanks were metallized with zinc in 1934 at the General Mills plant in Buffalo. Last inspected in 1950, no trace of rust could be found, and zinc remaining is expected to provide protection for an additional 15 to 20 years.

Metallizing Engineering Co., Inc.
1143 Prospect Ave., Westbury, L. I., New York • cable: METCO
In Great Britain:
METALLIZING EQUIPMENT COMPANY, LTD.—Chobham near Woking, England

DON A. WATSON METALLIZING ENGINEERING CO., INC.
1143 Prospect Ave., Westbury, Long Island, N. Y.

☐ Please send me, without obligation, Bulletin 62-B.
☐ Please have Metco Field Engineer call.

NAME_____
COMPANY_____
STREET_____
CITY_____ ZONE_____ STATE_____

When inquiring check CP 5137 opposite last page

Pail is graduated and has capacity of three gallons. It is equipped with a safety-grip hand hold on bottom edge. Dippers come in one and two quart sizes with reinforced handles and special pouring lips.

(Corrosion-resistant pails and dippers are products of Stokes Molded Products, Inc., Dept. CP, Taylor and Webster St., Trenton, N.J. . . . or for more information check CP 5138 on handy form opposite last page.)

Allyl-phenolic linings resist alkalis as well as acids

Uses: As linings for chemical storage and processing equipment.

Features: Linings resist solvents, acids, oils, and mineral salt solutions. In addition, this series is resistant to alkalis, both strong and weak.

Description: Allyl-phenolic linings are extremely hard, yet have good flexibility. They are odorless and tasteless after curing at steel temperatures from 340 to 370°F. Sterilizing with steam at pressures up to 10 psi has no effect on the lining. Installation can be made either in shop or field.

(Series 42A allyl-phenolic linings are product of Stalpic Div., A. Gusmer, Inc., Dept. CP, Woodbridge, N. J. . . . or for more information check CP 5139 on handy form opposite last page.)

Information on alloys for high temps

Included in twenty-two page brochure are notes on uses and characteristics of some of company's high-temperature and corrosion-resistant alloys.

"Super Alloys" is available from Dept. 44, Universal-Cyclops Steel Corp., Dept. CP, Bridgeville, Pa. When inquiring specify CP 5140 on handy form opposite last page.

the shaft seal for most chemicals

MADE OF TEFLON* *duPont Trademark

Combining chemically impervious duPont TEFLON with a balanced bellows design—Chemiseal external mechanical seals last longer and give unsurpassed performance under a wide variety of chemical service conditions.

Three years of actual field service handling acids, alcohols, alkalies, hydrocarbons—clear, abrasive and tarry materials—have proven it.

Seal rotates with shaft. Only bearing surface is between precision ground rotating and stationary faces.

Low friction load on shaft. Lower power cost.

No scoring of shafts. Shafts already scored by other seals or packing can be satisfactorily sealed.

Pressures at the seal up to 100 psi at 75° C or 75 psi at 100° C.

Sizes from ⅛" to 2⅛", maximum length 2¾". Other sizes for special applications.

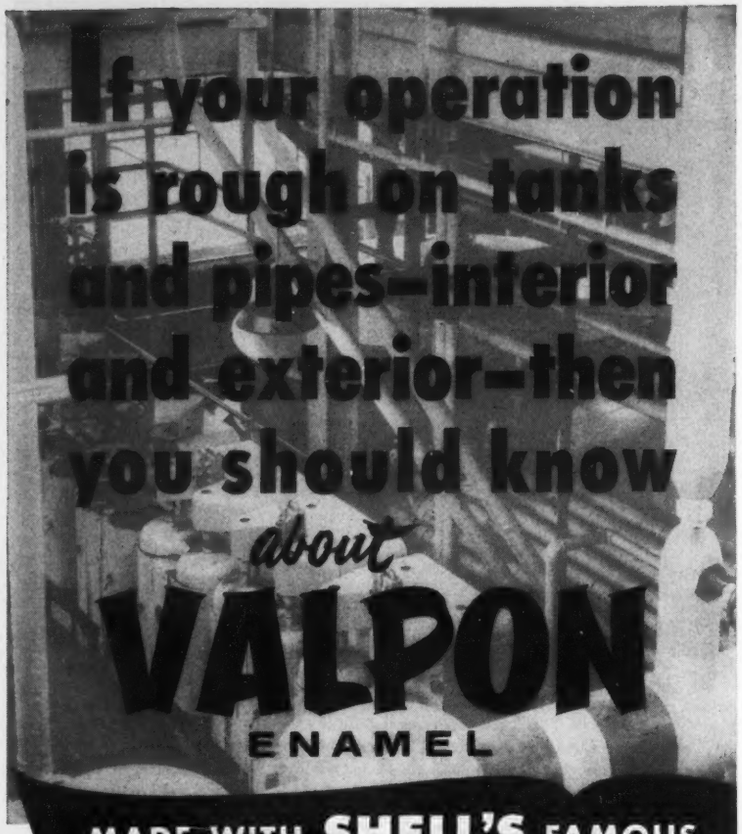
Write for Bulletin No. MS-954.

UNITED STATES GASKET COMPANY
CAMDEN 1, NEW JERSEY

USG

FABRICATORS OF FLUOROCARBONS & OTHER PLASTICS
Representatives in principal cities throughout the world

When inquiring check CP 5141 opposite last page

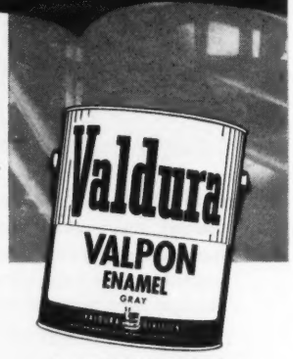


MADE WITH SHELL'S FAMOUS
EPON RESINS

Invulnerable to

OILS { ANIMAL / VEGETABLE / MINERAL

AND CAUSTICS . . .
with a new measure of
resistance to
ABRASION, ACID
& ALKALI SOLUTIONS
AND CORROSION



In suitable industrial colors and black and white.

If you'd like to know more about Valpon, mail your request on your regular letterhead to the address shown below.

VALDURA HEAVY DUTY PAINT DIVISION
AMERICAN-MARIETTA CO.
101 E. Ontario St., Chicago 11, Ill.

When inquiring check CP 5142 opposite last page

Sulfuric, nitric, other acids at temperatures to 400°F resisted by packing

Uses: In gaskets and other packing applications in corrosive service.

Features: Sheet packing is recommended for resisting sulfuric, nitric, and other acids in various concentrations, and for temperatures up to 400°F.

Description: Acid-resistant sheet packing, designated No. 1307, is made of white asbestos fibers completely impregnated and coated with an acid-resisting compound. Gaskets cut from this material are not as fragile or brittle as those made from sheets using Blue Asbestos fibers, because it has higher tensile strength and better flexibility. Processing is also relatively easy.

(Acid-resistant packing is a product of Packing Div., Raybestos-Manhattan, Inc., Dept. CP, Arnold & Stiegel St., Manheim, Pa. Check CP 5143 opposite last page.)

Ductile iron offers advantage in resistance to oxidation at 1300°F . . .

increase in silicon content improves resistance but lowers ductility

In recent experimental work it was shown that the oxidation resistance of cast iron containing spheroidal graphite, commonly called ductile iron, is much better than that of plain and alloyed irons containing flake graphite. An increase in silicon content improves the oxidation resistance but lowers the ductility, making metal sensitive to shock. Exposures were made for periods up to 4000 hours at 1300°F in a Leeds and Northrup Homo Tempering Furnace. Test results on alloys for 2000-hr period follow:

Material	Oxide Penetration at 1300°F, 2000° Hr Inches	Inches/Yr
Ductile iron, as cast*	0.012	0.053
Ductile iron, annealed*	0.013	0.057
Ductile iron, 4% Si*	0.009	0.039
Ductile iron, 5.5% Si*	0.000	0.000
Ductile Type 2 Ni-Resist*	0.012	0.053
Ductile Type 4 Ni-Resist*	0.000	0.000
Type 405 stainless	0.000	0.000
Type 2 Ni-Resist*	0.017	0.074
Cast steel	0.046	0.202
Wrought steel	0.044	0.193
Malleable iron	0.030	0.131
Cast Iron 1	0.043	0.188
Cast iron 2	0.035	0.153

At 1300°F ductile Type 2 Ni-Resist is slightly more resistant to oxidation than the same alloy containing flake graphite. Research work underway elsewhere, however, indicates that the difference between the two alloys is much greater at 1700-1750°F.

The **VALDURA** name stands for a complete line of specialized industrial maintenance products designed to serve every type of American industry. Typical products are indicated below. Other Valdura Specifics and Exclusives will be identified in future ads. Watch for them! They can solve your toughest maintenance problems.

Val-Chem serves as the *perfect* primer for Valpon or any of the Valdura finishes incorporating chemical resistance. It provides speedier drying and a vastly superior bond.

Tank-White combines *maximum* resistance to weathering and industrial fumes, and an extra measure of gleaming, prideful beauty.

If you have a particular maintenance problem which is urgent just describe it on your regular letterhead and mail to the address below. Your inquiry will be treated as an invitation to provide service . . . not as a license to exert selling pressure!

VALDURA HEAVY DUTY PAINT DIVISION
AMERICAN-MARIETTA CO.
101 E. Ontario St., Chicago 11, Ill.

When inquiring check CP 5144 opposite last page

Oxidation resistance of ductile Type 4 Ni-Resist and ductile iron containing 5.5% silicon is about equal to that of Type 405 stainless steel at 1300°F, all three materials being almost completely resistant. Tests indicated that rate of oxidation was decreasing with time. If tests had been continued to 8000 hours, lower rates might have been observed.

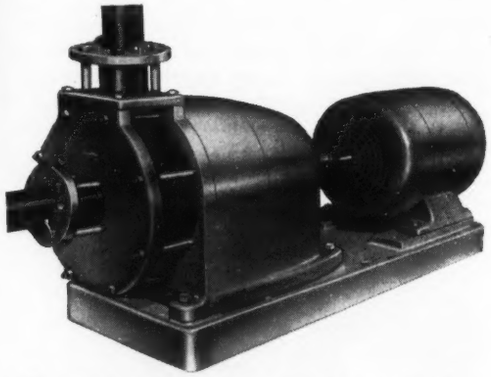
(*Samples furnished by International Nickel Co.)

(Condensed from technical paper, "Oxidation of Plain, Alloyed, and Ductile Cast Irons at 1300°F," by J. A. Cameron, Elliott Company, Jeannette, Pa. Paper was published in Corrosion, Vol 10, No. 9, Sept. 1954, pages 295-298.)

Impervious graphite seal renders pump virtually leak-proof

Uses: Intermittent or continuous handling of almost all corrosives such as hydrochloric acid, nickel plating solution, chlorinated organics.

Features: Seal on unit is virtually leak-proof. It is fabricated from graphite and has a self-cooled rotary section that is easily accessible. Graphite, called Impervite, is immune to effects of thermal shock, impervious to action of a wide range of acids, alkalis, salts, solvents, and organics at temperatures to 340°F. It has an extremely low coefficient of expansion.



Pumps are available in capacities from 25 to 200 gpm, at heads of 20 to 100'

Pump design also features over-sized bearings and heavy stainless steel shaft. Shaft and impeller are made as two separate and independent components, permitting simplified maintenance.

Description: Six models of Impervite centrifugal pumps are available in capacities from 25 to 200 gpm at heads of 20 to 100 ft. Motors are furnished for 1150 or 1750 rpm.

(Leak-proof centrifugal pump is a product of Falls Industries, Inc., Dept. CP, 31909 Aurora Rd., Solon, Ohio. Check CP 5145 opposite last page.)

Lapp Valves are Solid Porcelain

You need to make no compromise with contamination or corrosion from valves in chemical processing. Lapp valves are of *solid* Lapp Porcelain, a material unique as a ceramic for industrial scale chemical service. It alone offers the following combination of characteristics and qualities:

PURITY • Lapp Porcelain is a potassium aluminum silicate, made from selected clays, flint and feldspar...has no free iron or other metallic impurity.

NON-POROUS • Complete vitrification of all sections, through firing to 2300°F., provides *zero* porosity. No dye penetration of body in 100,000 psi test. No chemical can penetrate in service.

HIGH MECHANICAL STRENGTH

Compression strength .....100,000 lbs. per sq. in.
Tensile strength ..... 8,000 lbs. per sq. in.
Modulus of rupture ..... 15,000 lbs. per sq. in.

CHEMICAL RESISTANCE • Lapp Porcelain is unaffected by any acids except HF. It provides years of trouble-free service, handling hot acids in all concentrations, as well as mixed acids and other troublesome combinations.

UNIFORM QUALITY • Lapp Porcelain has been manufactured for 38 years for use in most severe chemical, electrical and mechanical services. Plant facilities include Lapp-patented vacuum processing, deaerating pug mills, two continuous tunnel kilns, and complete chemical, electrical and mechanical test equipment.

Write for bulletin with complete description, characteristics, and specifications. Lapp Insulator Co., Inc., Process Equipment Division, 326 Wendell St., LeRoy, N. Y.

An electrical test is the most searching inspection for physical soundness! Porcelain bodies for Lapp valves above are being flashed over—at 70,000 volts for three minutes. Any physical defect is revealed as an electrical puncture.

Y-valves, angle valves, flush valves, safety valves, and plug cocks of Lapp Porcelain have standard bolt-circle flanges for easy connection to all piping and equipment.

Lapp
PROCESS EQUIPMENT
Chemical Porcelain Valves • Pipe • Raschig Rings
Pulsafeeder Chemical Proportioning Pumps

When inquiring check CP 5146 opposite last page

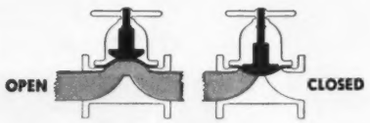
ALL-AROUND CHOICE

in industrial circles!

GRINNELL-SAUNDERS DIAPHRAGM VALVES

In industrial plants all around, Grinnell-Saunders Diaphragm Valves are preferred. *Why?* Because they have proved themselves economical and efficient in handling materials as diversified as corrosive fluids, gases, beverages, foods, compressed air, suspended solids . . . in lines where corrosion, abrasion, contamination, clogging, leakage and maintenance are costly factors.

Grinnell-Saunders Diaphragm Valves are available in a range of bodies, linings and diaphragm materials . . . and in a variety of styles and operating mechanisms. If you have a valve problem, it certainly will be well worth your while to consult a Grinnell engineer.



Types of Grinnell-Saunders Diaphragm Valves

Bodies
Screwed ends — ¼" thru 3"
Flanged ends — lined or unlined, ½" thru 18"
Butt weld ends — ½" thru 6"
Socket ends — ½" thru 4"

Angle Bodies
Screwed ends — ¼", ⅜", ½", ¾", 1¼", 2"
Flanged ends — ¾" thru 6".

Bonnets
Handwheel operated bonnet (available with rising stem, travel stops, extended stem, chainwheel, adapted for Tejax indicator)
Quick turn — lever operated bonnet, ½" thru 3"
Bendix-Westinghouse topworks
standard (air to close — spring to open)
Robotair, ¼" thru 1"
Rotochamber, 1" thru 4"; in tandem, 5", 6".
direct acting (spring to close — air to open)
Robotair, ¼" thru 1"
Rotochamber, 1" thru 4"
double acting (air to close — air to open)
Robotair, ¼" thru 1"
Rotochamber, 1" thru 4"
Piston operated, 6" thru 12"
Sliding stem bonnet, ½" thru 12"

Diaphragms
Natural rubber, neoprene, reinforced neoprene for vacuum, hycar, butyl, white gum rubber, Kel-F, Teflon, polyethylene.

Body Materials
Iron, bronze, stainless steel, cast steel, aluminum, monel, saran, durimet

Body Linings
Glass, lead, soft rubber, hard rubber, neoprene, saran

Bronze Beer Valves
Socket both ends
Socket end to flange end
Flange both ends
Socket end to male hose thread end
Flange end to male hose thread end
Male hose thread both ends

GRINNELL
WHENEVER PIPING IS INVOLVED

Grinnell Company, Inc., Providence, Rhode Island • Coast-to-Coast Network of Branch Warehouses and Distributors

pipe and tube fittings • welding fittings • engineered pipe hangers and supports • Thermolier unit heaters • valves
Grinnell-Saunders diaphragm valves • pipe • prefabricated piping • plumbing and heating specialties • water works supplies
industrial supplies • Grinnell automatic sprinkler fire protection systems • Amco air conditioning systems

When inquiring check CP 5147 opposite last page

Importance of surface preparation prior to coating pointed out

Importance of proper surface preparation in all coating or painting applications is discussed in illustrated bulletin. Possibility of coating failures due to adhesion loss, osmotic blistering, and under-film corrosion when this preliminary cleaning operation is poorly executed is discussed. Bulletin shows photographs of actual sandblast jobs and describes briefly various methods used to produce clean surfaces and insure a good bond and lasting finish.

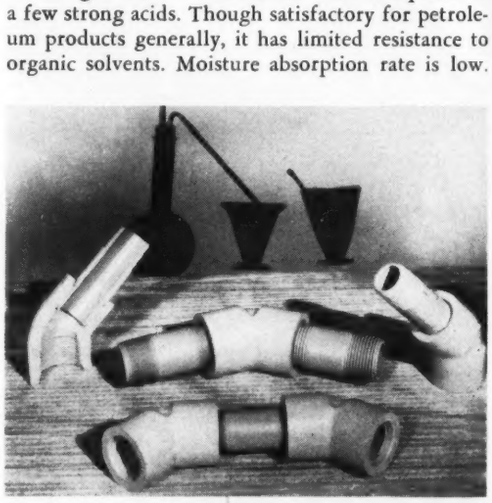
"Surface Preparation" is available from Protective Coatings Div., Metalweld, Inc., Dept. CP, Scotts Lane & Abbottsford Ave., Philadelphia 29, Pa. When inquiring specify CP 5148 on the convenient Reader Service slip which is located opposite last page.

Handles most common corrosives over a temperature range of –40 to 170°F . . .

high impact resistance, working pressures to 300 psi also featured by pipe

Uses: Indoor and outdoor applications handling most common corrosives in temperature range from —40° to 170°F.

Features: In addition to high impact resistance, plastic pipe is light weight, odorless, tasteless, and non-contaminating. It has excellent resistance to all inorganic acids and alkalis with exception of a few strong acids. Though satisfactory for petroleum products generally, it has limited resistance to organic solvents. Moisture absorption rate is low.



Description: Rigid plastic pipe, called Dur-Ace, is supplied in sizes from ½ to 2" in standard 20' lengths. There is a choice of two wall thicknesses. Fittings are also available with Standard IPS threads.

Working pressures at 70°F for extra-heavy-wall pipe range from 150 psi for 2" size to 300 psi for ½" pipe. The standard-wall working pressures range from 75 psi for 2" size to 150 psi for ½" pipe. Maximum working pressures are reduced as temperature goes up. Value for pipe at 170°F is about half that above for 70°F. (These working pressures are based on safety factor of 5 to 1.)

Pipe is not recommended for temperatures above 170°F, nor below −20°F where physical shock is present. It is easily threaded by standard equipment and can be bent if first heated.

(Rigid plastic pipe is a product of American Hard Rubber Co., Dept. CP, 93 Worth St., New York 13, N.Y. Check CP 5149 opposite last page.)

Sheet lining protects against corrosion or abrasion . . .

neoprene material is also used to repair damaged linings or conveyor belts

Uses: Recommended where severe corrosive and abrasive conditions are present, heavy thicknesses are required, and comparatively quick applications are a consideration.

Features: In addition to being resistant to abrasion, sheet lining can handle acids, plating solutions, alkalis, and various inorganic salt solutions at temperatures up to 190°F. It can be used to repair damaged rubber or neoprene linings, or rubber conveyor belts. Units repaired with this lining can be placed in service one hour after completion of repairs.

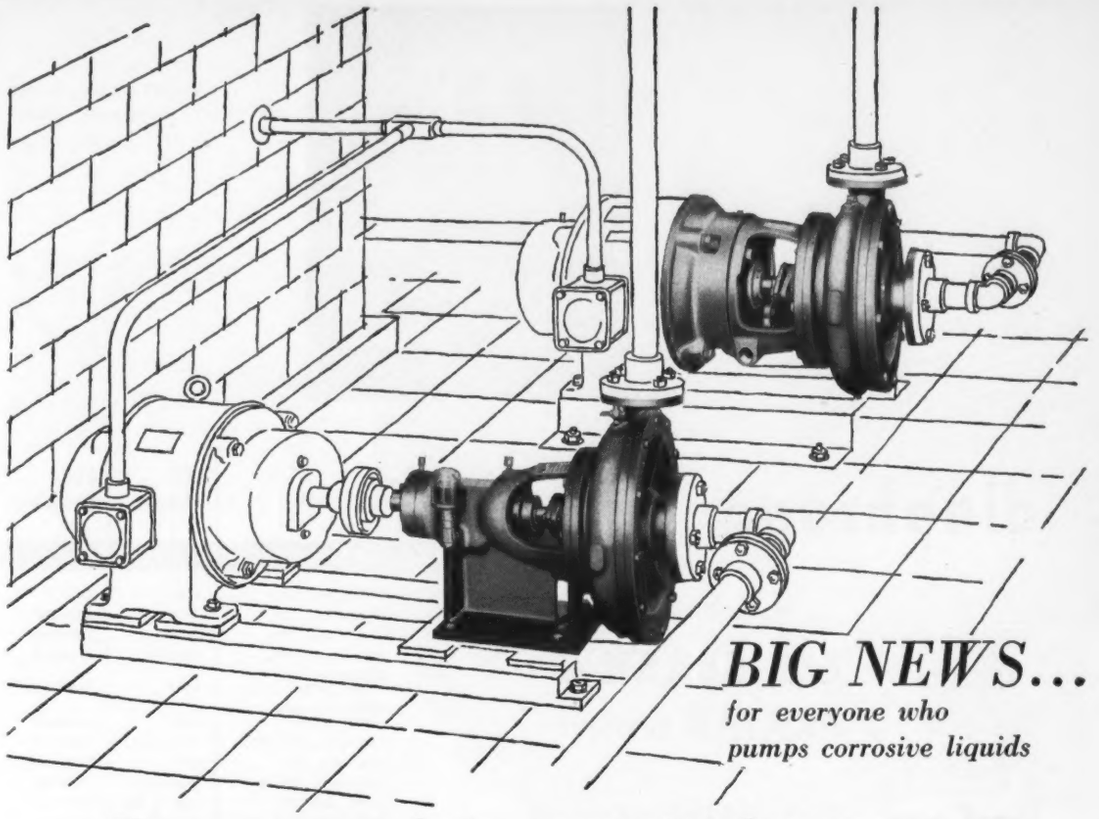
Description: Neoprene sheet lining, designated #750, is prevulcanized. Linings are supplied in rolls 32 to 34" wide in varying lengths. Thicknesses are 1/16, ⅛, and 3/16" depending on service requirements. Bonding of sheet to metal surface or to other neoprene is accomplished by use of company's neoprene Adhesive F-1.

(Neoprene sheet lining is a product of Carboline Company, Dept. CP, 331 Thornton Ave., St. Louis 19, Mo. Check CP 5150 opposite last page.)

✦ ✦ ✦

Special flares reduce smog

Every major refinery in Los Angeles County (Calif.) now has one or more smokeless flares in operation for controlling waste gas escapes. Flares are used to burn huge volumes of smog-forming gasoline vapors which must be disposed of during emergency shutdowns of a chain process in a refinery.



BIG NEWS...
for everyone who pumps corrosive liquids

Now you can get the **"custom-built"** *features you want at no penalty with the new* **AMPCO* Centrifugal Pump**

In a given pump size, new standard units give at least 108 different combinations, plus maximum resistance to corrosion, erosion, cavitation
Here's low-cost corrosive liquid transfer at its new, versatile best. If you require pumps in flows up to 600 gpm, this new 1750 rpm pump is exactly right for you. It can be built to *your* special requirements by interchanging standard parts.

You can select the bearings you want — sealed, replenishable-grease, or oil-lubricated.

You can choose your shaft seals — inside or outside mechanical seals; internal, external, or flushing packed stuffing-boxes.

You can get the exact shaft you need — no compromising. Take your choice of general-purpose and extra-rigid shafts as well as a new two-piece unit that allows removal of the rotating parts without disturbing coupling, bearings, or alignment.

You can select the pedestal height and type impeller you want.

Best of all, you don't have to buy another pump when conditions change. You can make modifications quickly and inexpensively in the field — save yourself valuable time and money.

Corrosion damage? Forget it. These pumps are built entirely from Ampco or other workable alloys to combat the effects of corrosive acids, alkalis, organic chemicals, etc. And these pumps have many new design features — features that contribute to dependable, maintenance-free pumping.

The new Ampco 1750 rpm Pumps are now stocked for immediate delivery. Contact your Ampco Pump Distributor or Field Engineer or mail the coupon.

AMPCO®
Ampco Metal, Inc.
Dept. CP-2, MILWAUKEE 46, WISCONSIN
West Coast Plant • Burbank, California

Fill out this coupon and mail today

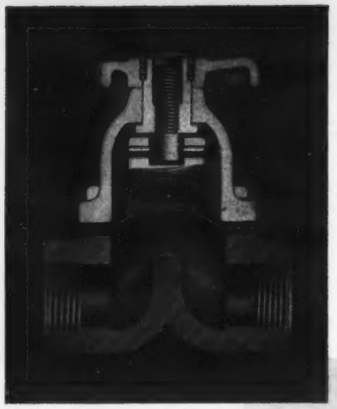
AMPCO METAL INC., Dept. CP-2, Milwaukee 46, Wisconsin
The new Ampco Pump sounds good to me. Send me additional information. I pump.....
Name.....Title.....
Company.....
Company Address.....
City.....(.....) State.....

*Reg. U. S. Pat. Off.

Maximum Interchangeability without Penalty

P-13

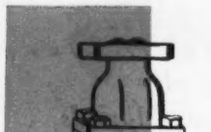
When inquiring check CP 5151 opposite last page



now!

diaphragm valves

. . . of chemical-resistant



ACE SARAN or PARIAN (Polyethylene)

Here's an all-purpose valve that combines the unique corrosion resistance of Ace plastics with the efficient Saunders diaphragm principle . . . a valve that cuts costs wherever corrosive liquids or gases are handled at normal temperatures and pressures.

Body is molded of Ace Saran or Parian. Diaphragm may be rubber, neoprene or polyethylene. Corrosives never touch metal. Bonnet assembly is sealed off from the solution. No stuffing box to leak. It can be serviced without removing from line – all parts are interchangeable. All sizes from ½ to 2 in., standard pipe threads. Working pressure 50 psi. at 77 deg. F.

Use Ace Saran and Parian pipe and fittings too, to make a completely protected system. You'll also be interested in the complete line of Ace hard rubber and rubber-lined chemical equipment. Write today for bulletins.

REAGENT	ACE PARIAN RATING	ACE SARAN RATING
Sulfuric acid, conc.	Good	Good
Sulfuric acid, 60%	Good	Excellent
Sulfuric acid, 30%	Excellent	Excellent
Sulfuric acid, 10%	Excellent	Excellent
Hydrochloric acid, conc. (37%)	Good	Excellent
Hydrochloric acid, conc. (10%)	Good	Excellent
Nitric acid, conc. (70%)	Unsuitable	Good
Nitric acid, 10%	Fair	Excellent
Acetic acid, glacial	Unsuitable	Excellent
Acetic acid, 10%	Poor to Fair	Excellent
Hydrofluoric acid, 48%	Fair to Good	Excellent
Oleic acid, conc.	Unsuitable	Excellent
Sodium hydroxide, 50%	Good	Good
Sodium hydroxide, 10%	Good	Good
Ethyl alcohol (denatured)	Good	Excellent
Acetone	Good	Fair
Carbon tetrachloride	Unsuitable	Good
"Ethyl" gasoline	Unsuitable	Excellent
Benzene	Unsuitable	Fair
Xylene	Fair	Good
Lubricating Oil	Unsuitable	Excellent
Calcium chloride, 15% aq.	Excellent	Excellent
Calcium hypochlorite	Excellent	Excellent
"Duponol" ME, 10% aq.	Excellent	Excellent
Triethanolamine	Excellent	Good
Camphor Oil	Unsuitable	Excellent
Ferric sulfate, 15% aq.	Excellent	Good
Linseed Oil	Fair	Excellent
Formic acid	Good	
Saturated salt water	Excellent	Excellent

● This is partial list only . . . ask for complete data.

ACE rubber and plastic products

AMERICAN HARD RUBBER COMPANY
93 WORTH STREET • NEW YORK 13, N. Y.

When inquiring check CP 5152 opposite last page

Stops corrosion in tanks and ducts and takes hard wear . . .

flexible lining material resists broad group of chemicals at temps to 160°F

Uses: Protecting tanks, fume ducts, and equipment used for mixing, storing, washing, shipping of corrosives.

Features: Flexible lining resists corrosive action of common acids, alkalis, salts, plating solutions, organic compounds, nitric, chromic and phosphoric acids — at operating temperatures up to 160°F.

"Who needs a tank with a lining like this?!"

Because material is inherently elastic, thermal expansion and contraction will not crack it. Damaging effects of mechanical abuse are minimized. Good insulating qualities minimize current loss in electrolytic reactions.

Description: Designated Vyflex L-10, the thermoplastic lining is based on polyvinyl chloride resins. It is available in either black or white. No curing is required.

(Corrosion-resistant lining is a product of Kaykor Industries, Inc., Dept. CP, 4402 Broad St., Yardville, N.J. Check CP 5153 opposite last page.)

Details on globe and stop valves for corrosion-resistant service

Globe and stop valves of corrosion-resisting alloys with bellows seal, diaphragm seal, O-ring seal, and conventional packings are described.

"Section B, Globe Valves" is available from Associated Valve & Engineering Co., Dept. CP, 1150 West Marquette Road, Chicago 21, Ill. Specify CP 5154 opposite last page.

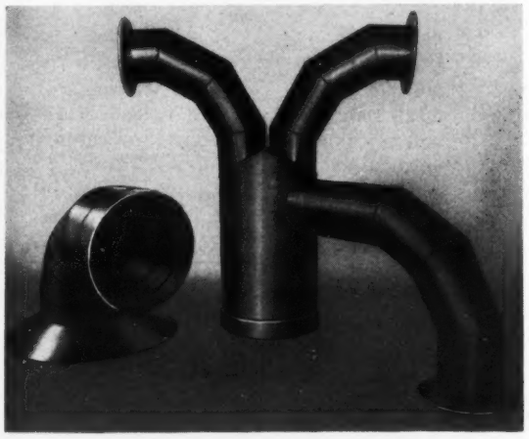
AGILENE (POLYETHYLENE)
AGILIDE (NON-PLASTICIZED) (POLYVINYL CHLORIDE)

"Barriers AGAINST CORROSION"

PLASTIC FABRICATIONS FOR THE CHEMICAL HANDLING INDUSTRIES

MODERN MATERIALS OF CONSTRUCTION

Agile's high-grade modern thermoplastic construction materials — AGILENE and AGILIDE—fabricated by a unique combination of forming and welding processes in which we specialize, are your safeguard for an economical and properly engineered installation.



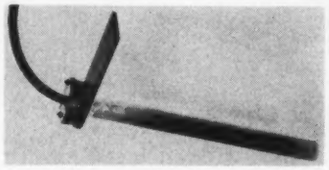
Seamless, corrosion-proof, ⅛ the weight of steel— These are the outstanding features of AGILENE® (polyethylene) ducting.
The installation lengths pictured above are of 14" and 28" diameter, flanged, to exhaust muriatic acid fumes from a dipping operation. These are an addition to an existing AGILENE® system which has already outlasted stainless steel 4 to 1.

American Agile Corporation
Principal General Offices • 5465 Dunham Rd., Maple Heights, Ohio
Mailing Address, P. O. Box 188 • Bedford, Ohio
DEPT C-1

When inquiring check CP 5155 opposite last page

No damage to unit when heating corrosives . . .

fused quartz shell protects immersion heater



Heater is available in lengths from 10 to 34"

Uses: Heating highly corrosive liquids.

Features: Heater is constructed with a chemically pure fused quartz shell which is inert to practically all corrosives except hydrofluoric acid and concentrated hot caustic solutions. Unit also has excellent thermal shock resistance and heat conductivity.

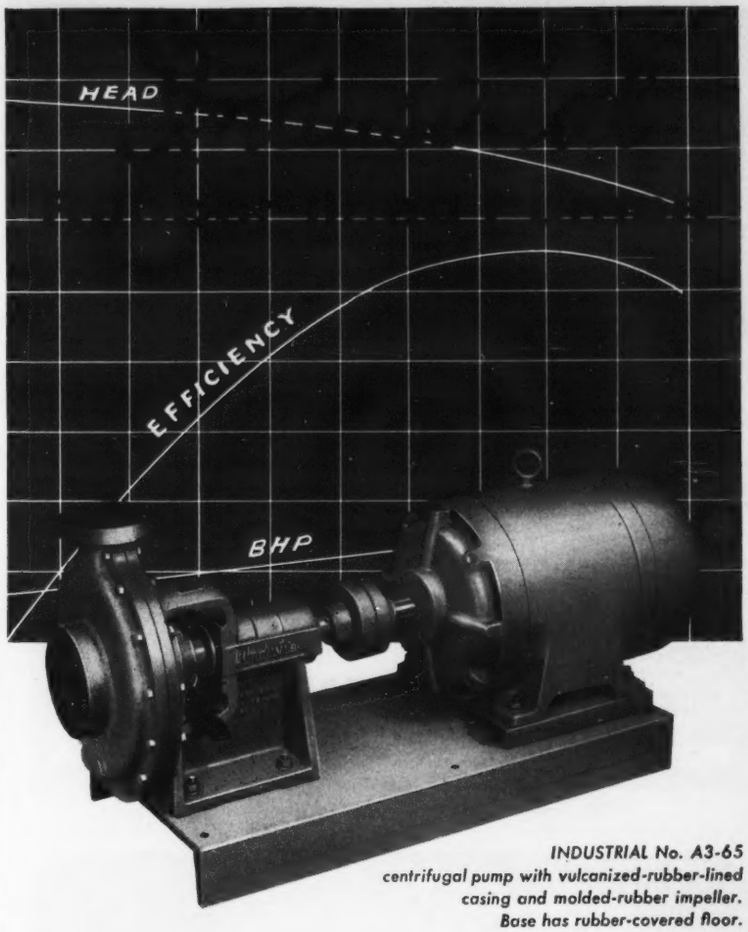
Description: Immersion heater, called the ThermX, is available in lengths from 10 to 34", and in capacities from 500 to 6000w, 115 to 230v. Supports are available for simplicity of mounting on various kinds of equipment.

(Immersion heater for corrosives is a product of N. J. Thermex Co., Dept. CP, 535 Bergen St., Harrison, N.J. . . . or for more information check CP 5156 on handy form opposite last page.)

Details mechanical seal of Teflon

Mechanical seal, combining properties of Teflon with bellows design, is described in eight-page bulletin. Tests have proven the seals to be long lasting under a variety of chemical service conditions. Features and specifications of rotating seal are covered. Line drawings illustrate textual material.

Bul MS954 is issued by United States Gasket Co., Dept. CP, Camden 1, N.J. When inquiring specify CP 5157 on handy form opposite last page.



INDUSTRIAL No. A3-65 centrifugal pump with vulcanized-rubber-lined casing and molded-rubber impeller. Base has rubber-covered floor.

for corrosive and noncorrosive liquids

The latest in pump engineering and design is incorporated in INDUSTRIAL centrifugal pumps for maximum efficiency and severe, continuous service. Lined with soft rubber for abrasive slurries or hard rubber as specified, balanced rotating assembly mounted in ball bearings, corrosion-proof stuffing box to permit external liquid seal if required, easily removable packing gland nut and ample space for repacking stuffing box, simple adjustment of impeller clearance are some of the features.

These pumps are made in a range of sizes with capacities up to 240 gpm., operating heads up to 240 feet, and ¾ to 15 hp. They are furnished either with or without base, motor, and coupling

Complete Information on Request 5150

INDUSTRIAL
FILTER & PUMP MFG. CO.
5908 Ogden Avenue • Chicago 50, Illinois

PRESSURE FILTERS
ION EXCHANGERS
RUBBER LININGS
HEAT EXCHANGERS
CENTRIFUGAL PUMPS

When inquiring check CP 5158 opposite last page

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We specialize in Electronic Equipment for Research, Development, Maintenance and Production Operations

Simplify and speed *all* your electronic supply purchases. Order from the world's largest stocks of electron tubes (all types), test instruments, audio equipment, electronic parts (transformers, capacitors, controls, etc.) and accessories—*everything* for industrial and communications application. Let our expert Industrial supply service save you time, effort and money. Send today for your FREE copy of the 1955 ALLIED Catalog—the *complete* up-to-date guide to the world's largest stocks of Electronic Supplies for Industrial and Broadcast use.

One complete dependable source for everything in electronics

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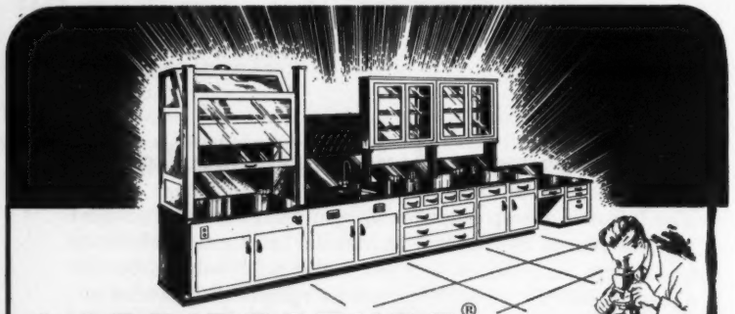

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METALAB offers a basic method in laboratory planning ... called, "LABRITECTURE." This technique will assist and direct you in the modernization and expansion of your laboratory or in planning a new one. Our new 4B Catalog and Manual will give you the sound basis for solving these laboratory problems.

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Name_____ Title_____

Company_____

Address_____

City_____ Zone_____ State_____

When inquiring check CP 5160 opposite last page

for the laboratory

Operator starts test by placing weighted, notched strip in controlled temperature furnace

Time-temperature test of breaking point can . . .

tell molecular weight of high polymer in minutes

Uses: Tells molecular weight of thermoplastic high polymers accurately in testing time of as little as seven minutes.

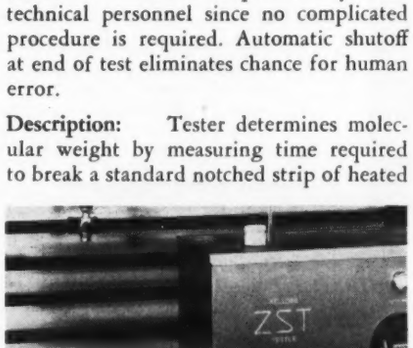
Features: Can be operated by non-technical personnel since no complicated procedure is required. Automatic shutoff at end of test eliminates chance for human error.

Description: Tester determines molecular weight by measuring time required to break a standard notched strip of heated polymer held at controlled temperature. Small static weight is used as load. Seven minute time for test includes cutting notched strip.

Compact tester operates from standard 110v, 60 cy line. Controlled temperature is set by means of power stat control. Weighted, notched strip is placed in furnace. When strip breaks, weight falls on cutoff switch which shuts off furnace and running-time meter. Time for breaking is referred to calibration curve for plastic under test to give molecular weight.

Tester has two complete units which may be used individually or simultaneously. Separate pilot lights and running-time meters indicate end of tests and results. Sample holders, calibrated clip weights, cups, thermometer, holders, notch cutter, etc, are included with tester.

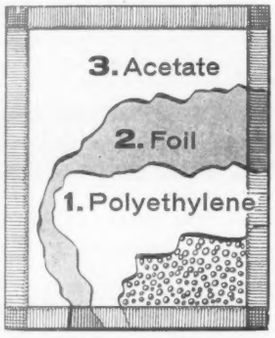
(Though used with all types of high polymers, ZST Tester was developed by M. W. Kellogg specifically for testing Kel-F. Tester is commercially available through F. J. Mullowney Co., Dept. CP, 160 Passaic St., Trenton, N.J. . . . or for more information check CP 5161 on handy form opposite last page.)



Sample holder is shown here in front of typical calibration curves

Convenience is top feature of one-shot package

High purity reagents packed in 10 or 25 gram envelopes — sixteen analytical standards now available



Packaging of reagents in tough, completely sealed laminated envelopes is intended to reduce waste, eliminate overlapping sizes of containers and supply simpler method of inventory control.

Envelope is triply-laminated, chemical-resistant and disposable. Innermost layer is polyethylene, middle is aluminum foil and the outside, acetate.

Reagents are packaged 5, 10 or 25 grams to a pack depending on their bulk. Ten packs make up a box, 12 boxes a case.

At present the following reagents (ACS) are available:

- Ammonium Chloride
- Barium Chloride
- Dextrose, Certified
- Ferrous Ammonium Sulfate
- Magnesium Sulfate, Crystals
- Oxalic Acid, Crystal
- Potassium Carbonate, Phthalate
- Potassium Hydrogen Anhydrous
- Potassium Permanganate
- Sodium Acetate, Crystal
- Sodium Carbonate, Anhydrous
- Sodium Chloride, Granular
- Sodium Hydroxide Pellets
- Sodium Thiosulfate, Crystal
- Sodium Oxalate Powder
- Sodium Tartrate Dihydrate

Plans are to package nearly 200 chemicals for which specifications have been established by the American Chemical Society. Still in the research stage is the packaging of liquids and hygroscopic solids.

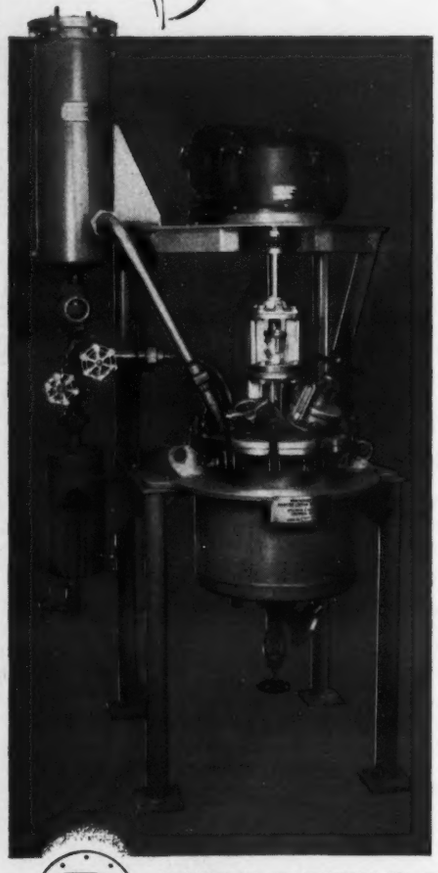
(Gram-Pacs are a product of Fisher Scientific Co., Dept. CP, 717 Forbes St., Pittsburgh 19, Pa. . . . or check CP 5162 opposite last page.)

When inquiring check CP 5163 opposite last page

NEW for Phenolic Resins

First on the market with a lab pilot kettle specially designed for phenolic resins, Brighton Copper Works offers a versatile Model C-10 to the chemical processing industry. Though built primarily for phenolic resins the C-10 is adaptable to many other processes.

Of stainless steel construction, the kettle features an anchor-type agitator with variable speed drive, condenser and receiver, condensing arrangement for either refluxing or withdrawing. Production sizes can be built up to 3000 gallon capacities.



Here are its features:

1. Designed for vacuum operation.
2. Steam jacketed for 150 psi.
3. Jacket provided with continuous spiral baffle to insure maximum cooling efficiency when water is circulated.
4. Made according to ASME code, inspected and stamped for internal pressures up to 25 psi or vacuum.
5. Flush-type bottom outlet valve.
6. Specially designed, trouble-free oilless agitator shaft bearing.
7. Sight glasses, quick opening handhole.
8. Overall dimensions: 86" x 39" x 56".

WRITE DEPT. D FOR BULLETIN.

BRIGHTON copper works inc.

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DIVISIONS: F. C. DECKEBACH SONS CO., HAMILTON COPPER & BRASS WORKS, BUCYRUS KETTLE WORKS

est. 1914 • engineers • metalsmiths • machinists • designers, producers of chemical processing equipment

When inquiring check CP 5164 opposite last page

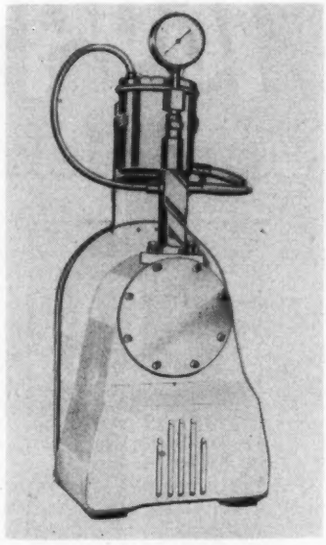
LABORATORY

Head easily removed from homogenizer for cleaning . . .

unit handles from 100 cc to 15 gal per hour

Uses: For homogenizing such materials as starch slurries, chemicals, coatings, cosmetics, and pharmaceutical products.

Features: Laboratory homogenizer uses no packing or stuffing boxes. By removing homogenizing valve, equipment can be used as high pressure pump up to 3000



All parts contacting materials are stainless steel

psi. Head can be completely removed for cleaning and autoclaving. Products are separated from drive mechanism during homogenization.

Description: All metal parts contacting materials are 316 stainless. Self-priming unit is powered by ¾ hp AC motor. Homogenizer handles from 100 cc to 15 gal per hour.

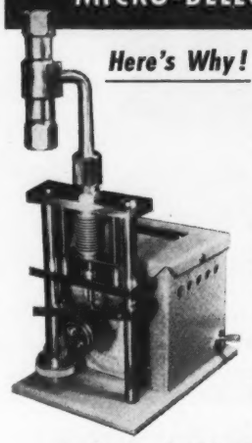
Unit includes pressure gage, reservoir, and Tygon tubing. Homogenizer is 40" high x 18" wide and weighs 250 lb.

(Model B-25 Homogenizer is a product of C. W. Logeman Co., Dept. CP, 633 Bergen St., Brooklyn 38, N.Y. . . . or check CP 5165 on handy form opposite last page.)

The Perfect Pump for Chemical Laboratories . . .

CORSON-CERVENY

MICRO-BELLOWS PUMP



Here's Why!

- All parts in contact with pumped liquid are stainless steel.
- Cone-to-taper fittings prevent materials handled from contamination by the pump.
- Adaptable to many highly specialized uses. It can be equipped to facilitate handling of high melting materials, to pump low boiling materials, to handle gaseous materials.
- It's compact—6" x 3½" x 10⅜"; weighs 5.6 lbs. Made in three sizes for pump rates of 15 to 1000 ml. per hour; 30 to 2000 ml. per hour; and 30 to 7000 ml. per hour. Also available in "Teflon."

We have a booklet that gives all construction, operation and application details of the Corson-Cerveny Micro-Bellows Pump. Write for your copy.

RESEARCH APPLIANCE COMPANY

Box 134, Cemetery Lane, Pittsburgh 9, Pa.

When inquiring check CP 5166 opposite last page

For laboratory investigations, analytical tests or production control requiring heat testing

specify a

DESPATCH LABORATORY OVEN

- Accurate, Fast, Rugged
- Sensitive Indicating Control
- Forced Air Circulating
- Choose From Nine Models

Here is the practical solution for laboratories, manufacturers and chemical producers who operate with close temperature requirements.

Despatch has more than 52 years' experience in designing and producing laboratory ovens, and has placed emphasis where it belongs—on rugged construction and temperature uniformity—constant heat with even distribution—the ability of its ovens to perform accurately at peak temperatures for extended periods of time. Nine basic models provide oven capacities from 1 to 60 cubic feet.

DESPATCH LABORATORY OVENS, finished in handsome gray hammeroid enamel, offer a combination of controls especially designed for the application for regulating temperatures up to 600 degrees. An efficient forced exhaust system carries off volatile gases or moisture laden air for hazard safe, fast drying laboratory test work.

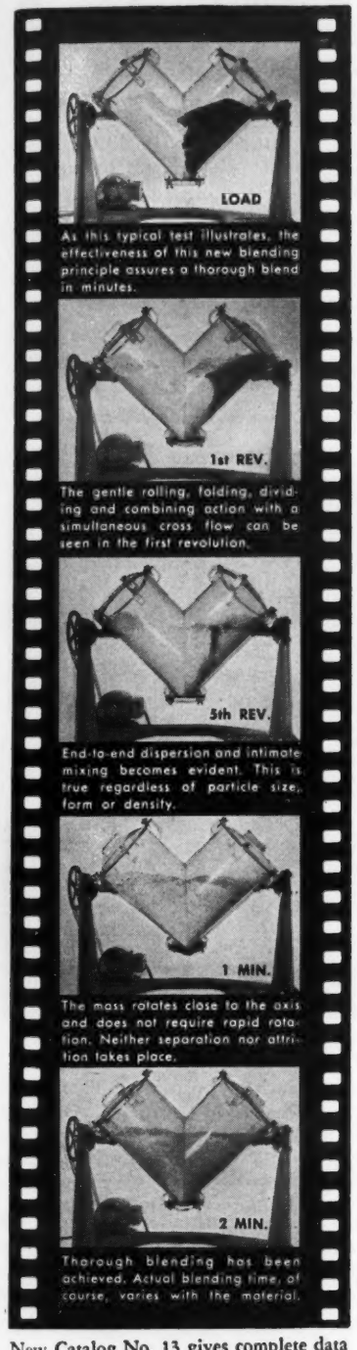
For complete data on Despatch Laboratory Ovens, write for Bulletin #100 stating product to be processed, time and temperature cycle and size of oven required.

DESPATCH OVEN CO. Established 1906

DESPATCH OVEN COMPANY
343 DESPATCH BUILDING,
MINNEAPOLIS 14, MINNESOTA

When inquiring check CP 5167 opposite last page

Here's why the p-k twin shell blender is faster and better:


LOAD
As this typical test illustrates, the effectiveness of this new blending principle assures a thorough blend in minutes.
1st REV.
The gentle rolling, folding, dividing and combining action with a simultaneous cross flow can be seen in the first revolution.
5th REV.
End-to-end dispersion and intimate mixing becomes evident. This is true regardless of particle size, form or density.
1 MIN.
The mass rotates close to the axis and does not require rapid rotation. Neither separation nor attrition takes place.
2 MIN.
Thorough blending has been achieved. Actual blending time, of course, varies with the material.

New Catalog No. 13 gives complete data on sizes, construction details and performance.

the **Patterson-Kelley Co., Inc.**
720 Lackawanna Ave.
© 1904 East Stroudsburg, Pa.

When inquiring check CP 5168 opposite last page

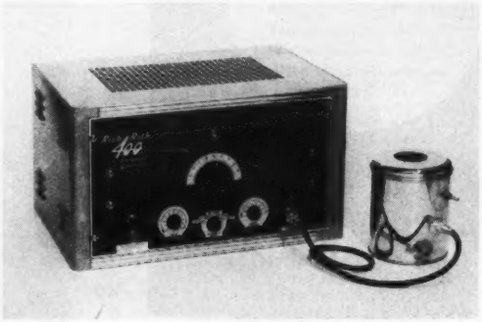
Generates wide range of ultrasonic frequencies for transducers . . .

unit is continuously tunable over frequencies from 10 to 1200 kc

Uses: For generating ultrasonic frequencies which may be fed to variety of transducers for degreasing, emulsifying, impregnating, degassing, dispersing, coagulating, extracting, fragmenting and depolymerizing operations.

Features: Generator is continuously tunable over frequency range from 10 to 1200 kc. Selection of output impedances couples generator to various kinds of piezoelectric and magnetostrictive transducers.

Description: Generator is rated at 400 watts and may be coupled with metal-jacketed and lined, fully-enclosed water-cooled treatment chamber



Variety of transducers may be coupled to ultrasonic generator

transducers. Flanged flow-through chamber transducer can be bolted into pipe line for continuous processing of materials.

(Rich-Roth "400" generators are products of Rich-Roth Laboratories, Dept. CP, 1240 Main St., Hartford, Conn. . . . or for more information check CP 5169 on handy form opposite last page.)

Polyethylene tubes designed for use in centrifuges

Centrifuge tubes of polyethylene have been designed to fit standard makes of centrifuge heads. Two styles of tubes are available — 15 ml conical bottom and 50 ml round bottom. Virtually indestructible and leakproof, tubes withstand largest centrifugal forces without distortion.

(Polyethylene centrifuge tubes are a product of Nalge Co., Inc., Dept. CP, 625 S. Goodman St., Rochester 20, N.Y. . . . or for more information check CP 5170 opposite last page.)

Mass Spectrometry . . .
on a practical industrial basis

Two companion instruments, Types 21-610 and 21-620, now extend the speed and accuracy of mass spectrometric analysis from the laboratory out into the plant. Flexible and simplified, needing only 115 volts and a small supply of cooling water, the twin instruments are easily adaptable to process-stream monitoring, batch work, or leak detection.

For monitoring & controlling streams to [illegible] . . .

TYPE 21-610 is moderately priced and a truly general-purpose instrument. Although primarily designed for continuous petroleum and petrochemical stream analysis, it is also valuable as a production-line leak detector or laboratory analytical instrument. It has been used in applications ranging from on-the-spot acetylene-plant monitoring to hospital clinical tests on lungs.

For higher resolving power, readings to [illegible] . . .

TYPE 21-620 has the highest mass range of any instrument in its compact size range. Using the newly developed "Cycloidal Focusing" principle for analysis, it goes beyond the 21-610 for accurate readings from mass 2 to mass 150. Medical laboratories, petro-chemical plants and general research organizations will all find it an ideal answer to their analytical problems.

Modifications . . . accessories

The 21-610 may be converted to a 21-620 whenever the latter's greater resolving power is needed. The work is accomplished by a CEC Field Service Engineer without return of the instrument to the factory. Involving primarily the exchange of some components and the addition of certain others, the conversion is made reasonably and quickly.

An extensive accessory line greatly broadens the utility of both the 21-610 and 21-620. Automatic peak selectors scan as many as six mass numbers on a repetitive cycle; sampling probes and magnet shunts make either instrument a practical production-line leak detector; batch-sample inlet systems and continuous-chart recorders (left) may be mounted directly on the instruments.

How industrial mass spectrometry can be used in *your* business is explained in Bulletin CEC 1824A-X14. Send for your copy.

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Corporation
ELECTRONIC INSTRUMENTS FOR MEASUREMENT AND CONTROL
300 North Sierra Madre Villa, Pasadena 15, California

Sales and Service Offices Located In: *Albuquerque, Atlanta, Buffalo, Chicago, Dallas, Detroit, New York, Pasadena, Philadelphia, Seattle, Washington, D. C.*

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SAVE MONEY — CADWELD FABRICATED ELECTRICAL ASSEMBLIES

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1. Initial costs.
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our factory fabricated jumpers, leads or lug assemblies made with CADWELD connections —Guaranteed to out perform the cable itself.

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CADWELD®

...the electrical connection that:

- cannot loosen or corrode
- is 100% electrically efficient
- has small O. D. for easy insulating
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☐ Have Representative Call

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When inquiring check CP 5172 opposite last page

FOR THE LABORATORY

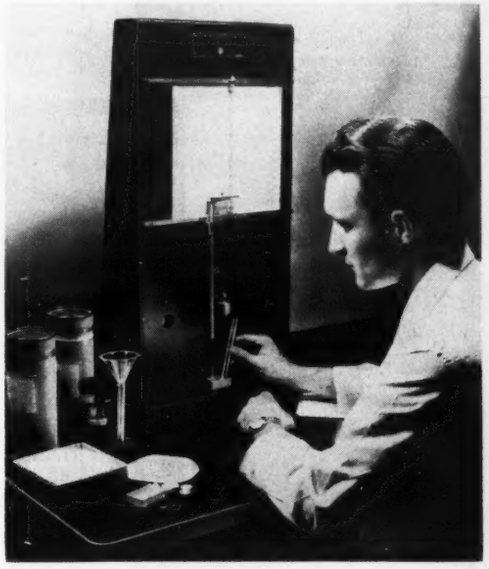
Determines size of particles too small to be measured by sieves . . .

calibrator for unit permits operator to relate data and check on accuracy of instrument

Uses: Measures particles too small for sieves by determining resistance to air-flow of weighed sample under standard packing conditions.

Features: Unit measures particles in size range from 0.2 to 50 microns. Calibrator attachment furnishes primary standard which permits users to relate their data directly to those of other users.

Description: Motor-driven air pump builds up regulated constant pressure and sends steady flow of dry air through packed sample. By always using equal-volume samples and observing degree of



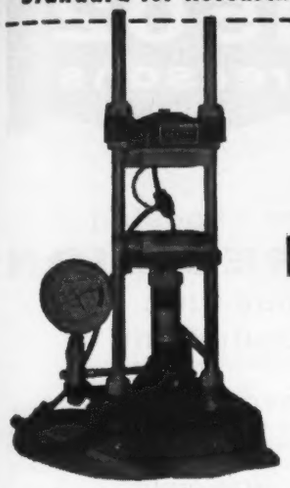
Determines particle sizes directly in microns

packing, variables such as porosity and voids are automatically compensated by instrument. Operator merely sets calculator pointer at liquid level of manometer and reads particle size directly in microns from chart.

Calibrator attachment is natural ruby with orifice in center. Mounted in precision-bore tube of same dimensions as sample tube, it is connected to air duct in same manner as sample tube. Instrument is adjusted by bleeding off requisite amount of air to make manometer height agree with value engraved on side of calibrator.

(Sub-sieve Sizer and Calibrator Attachment are products of Fisher Scientific Co., Dept. CP, 717 Forbes St., Pittsburgh 19, Pa. . . . or for more information check CP 5172A on handy form opposite last page.)

Standard for Research and Development



the CARVER LABORATORY PRESS

. . . wherever Pressing is required.

Accurately controlled pressures to 20,000 lbs.; 6-inch gauge mounted on base. Carver Standard Accessories include Electric or Steam Hot Plates, Carver Test Cylinders, Swivel Bearing Plates, Cage Equipment. Available from stock. Write for catalog.

FRED S. CARVER INC.
HYDRAULIC EQUIPMENT
52 RIVER ROAD, SUMMIT, N. J.

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King MANOMETERS

Every Size – for Every Service

U-Type Manometers
- Single Cleanout
- Single Gland-Packed
- Double Cleanout
- Double Gland-Packed
- High Pressure

Low in price, Trouble-free, Easy to install and read

Well-Type Manometers
- Low Well
- Raised Well
- Barometric Reading

Stay clean longer, Easy to service

Multi-Tube Manometers
- Multi-Well
- Common-Well
- Special-Purpose

FREE LITERATURE gives sizes, construction and prices. Write today! And ask for informative 12-page Manual on Manometers.

KING ENGINEERING PRODUCTS include King-Gages — Manometers — Self-Closing Push Valves — Pressure Transmitters — Sight Feed Bubblers — Overflow Check Valves — Air-flow Snubbers — Sediment Traps — Moisture Indicators

KING ENGINEERING CORP.
Box 270 • Ann Arbor, Mich.
REPRESENTATIVES IN PRINCIPAL CITIES

When inquiring check CP 5174 opposite last page

Lays down wet film of any thickness

Uses: For laying down wet films of any desired thickness. It is particularly useful in laying down test films of plastic coatings, varnishes and adhesives.

Features: Improved form of doctor blade allows unit to better establish and draw down film from starting mass to its final thickness.

For laying down wet film

Description: Applicator is composed of aluminum block and stainless steel doctor blade joined together with washer and thumb screw. Two-inch long slot is marked with mil gradations to establish desired film thickness. It is furnished in three mil ranges: 0-10, 5-25 and 20-40.

(Ultra Applicator is a product of the Gardner Laboratory, Inc., Dept. CP, 4723 Elm St., Bethesda 14, Md. . . . or for more information check CP 5175 on handy form opposite last page.)

Provides information on lab shakers

Manufacturer's complete line of laboratory shakers are pictured and described in four-page, two-color bulletin. Shaking motion of units duplicates mixing swirl of hand shaking. Units are designed to handle from 8 to 40 Erlenmeyer flasks or other containers.

Bul No. 307 is issued by Burrell Corp, Dept. CP, 2223 Fifth Ave., Pittsburgh 19, Pa. Check CP 5176 opposite last page.

A completely dieselized transportation system serves the Alberene quarries and mills and connects with the C. & O. R. R. at Esmont, Va.

Let's talk "DELIVERIES!"

For practical purposes, the supply of Alberene Stone is inexhaustible. It is quarried, milled, and transported by the most modern and efficient methods.

With reasonable cooperation from the purchaser, we can schedule our production of stone to meet the requirements of contractors and laboratory equipment manufacturers.

There's no need to let deliveries interfere with getting Alberene Stone — *the natural silicate stone with the surface that goes all the way thru!* Only Alberene Stone can be cut, drilled, tongued and grooved, refinished and reused almost indefinitely.

For information and technical assistance, address: Alberene Stone Corporation, 419 Fourth Avenue, New York 16, N. Y.

ALBERENE STONE

provides LOW ABSORBENCY protection

When inquiring check CP 5177 opposite last page

ALL-CHEM . . . the ALL-TEFLON and STAINLESS STEEL PUMP

● Tired of figuring pump requirements for each new problem . . . Searching for solutions among a myriad of makes and models . . . Carrying a peck of replacement parts?

Standardize on Eco "All-Chem" Pumps—the universal pumps for lab., pilot plant and low volume chemical feed in production service.

The specs. are simple. Corrosion and contamination-wise, they handle anything stainless steel will handle.

They pump from 1 to 10 g.p.m. at pressures up to 70 p.s.i. They are positive displacement pumps with the highest suction lift over widest temperature and viscosity range.

Fluid delivery is non-deviating and non-foaming.

Adaptable to direct motor connection at 1750 RPM—or any other power source.

Self-priming on non-volatile liquids.

Unequalled for safe handling of such hazardous liquids as nitric acid and hydrogen peroxide.

Widely used in nuclear, guided missiles and other classified government installations.

Write for Bulletin A-3. Sent on request.

ECO Engineering Company
12 New York Ave • Newark 1 • N.J.

All-Chem PUMPS

ECO

ENGINEERING COMPANY

When inquiring check CP 5179 opposite last page

FOR THE LABORATORY

Permits accurate detection of weak beta particles at short ranges . . .

cell may be used with commercially available scalers or count rate meters

Uses: For detection of radiation, especially radioactive isotopes which emit weak beta particles of low energies and short ranges.

Features: Radioactive samples may be positioned so that they are part of counter wall itself. This is accomplished by using only a microscopically-thin window between sample and tube interior.

Description: Soft beta rays easily penetrate 120 mg/cm² window. Detector may be used on most commercially available scalers or count rate meters.

(Mod D47 gas flow counter is a product of Nuclear-Chicago Corporation, Dept. CP, 229 W. Erie St., Chicago 10, Ill. . . . or for more information check CP 5180 on handy form opposite last page.)

Automatically translates dye density of finished electrophoretic strips into pen-drawn curves . . .

system has two cells, regulated power supply, and curve-drawing integrator

Uses: For identifying and measuring concentration of complex organic compounds by electrophoretic methods.

Features: Finished strips are analyzed automatically by photoelectric unit which translates dye density of strips into pen-drawn curve of component concentration. Corresponding saw-tooth line gives direct and immediate integration of areas under any selected portions of curve.

Description: Spinco Model R paper electrophoresis apparatus consists of automatic electronic curve-drawing integrator, two 8-strip electrophoresis cells, and constant-current/constant-voltage regulated power supply. Power supply energizes one or both of the cells and employs low-voltage relay system which permits high voltage to appear at terminals only when they are attached to cell.

Cell units, of transparent plastic, have detachable racks which can be opened flat for installation of paper strips and for oven drying strips at finish

1502 reasons

for choosing

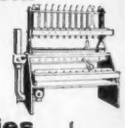
PRECISION Scientific Equipment

Reason 1—Precision laboratory equipment has earned a justly deserved reputation over the years for quality in research laboratories all over the country.

Reason 2—Precision has an ever increasingly wide range of stock on hand for immediate delivery to you.

1500 More Reasons—Precision is the only manufacturer of a complete line of research laboratory equipment. Some 1500 items are quality-made by Precision for accuracy and dependability in the laboratory. Precision equipment includes:

Kjeldahl Equipment
Standard models and custom set-ups for every distillation and digestion need. Kjeldahl Extraction Rack illustrated.



Laboratory Utilities
A complete line of "tools" and accessories for the laboratory. Sero-Utility Bath, at right, can be used as either a serological or utility bath.

Water Stills
For processing or laboratory use. Recommended for use even with the hardest raw water. Electric, gas or steam heated. Automatically controlled.

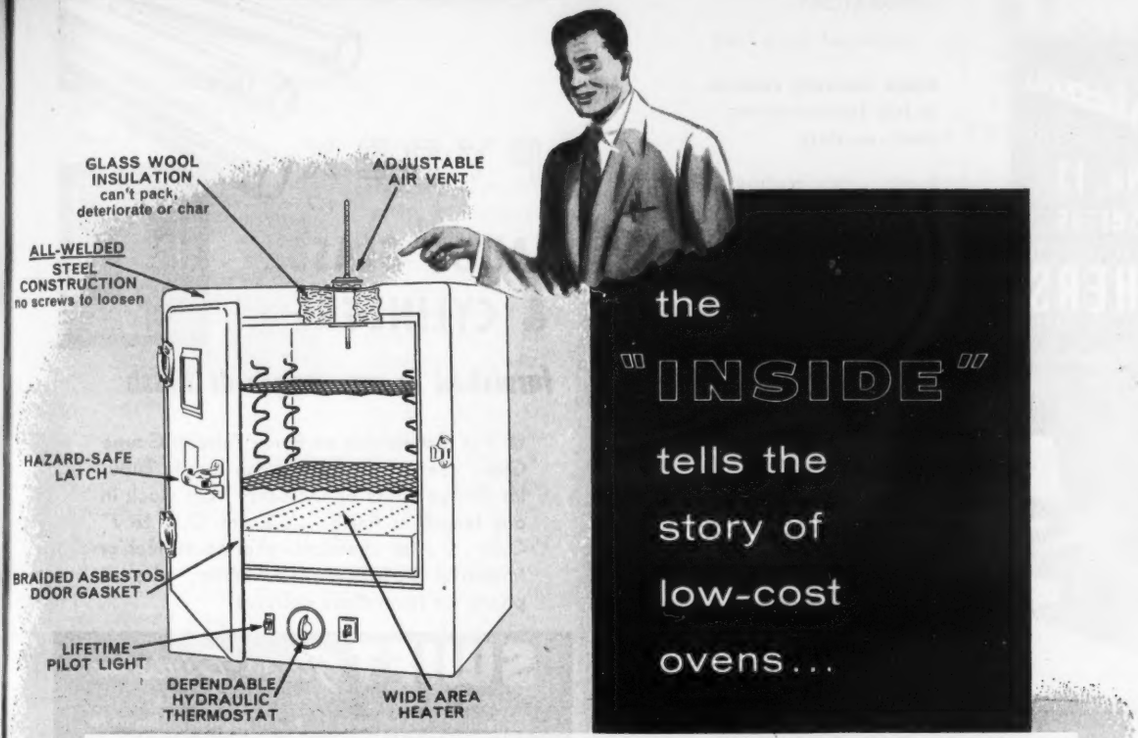
Flash Point Testers
Cleveland type shown. Meets applicable A.S.T.M. and A.A.F. specifications.

For complete catalogs on any of the above equipment, write:

Precision Scientific Company

3747 W. CORTLAND STREET
CHICAGO 47, ILLINOIS

When inquiring check CP 5181 opposite last page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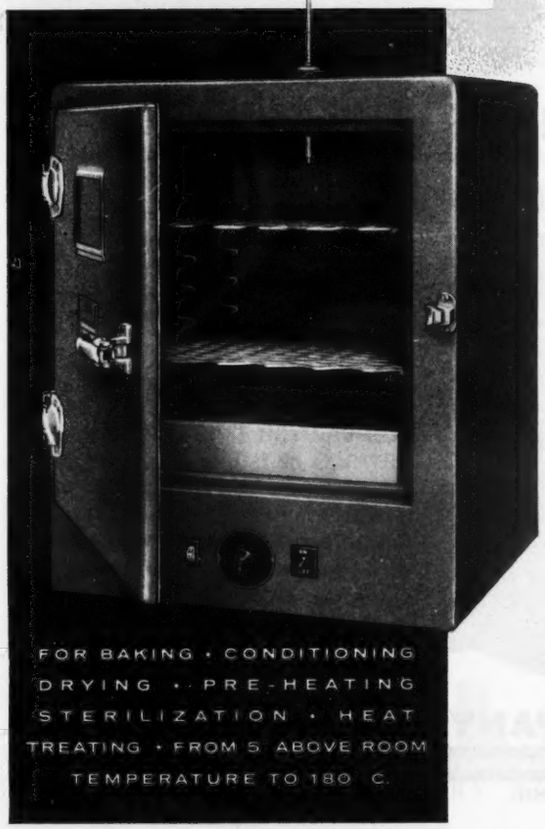
ADJUSTABLE AIR VENT
ALL-WELDED STEEL CONSTRUCTION no screws to loosen
HAZARD-SAFE LATCH
BRAIDED ASBESTOS DOOR GASKET
LIFETIME PILOT LIGHT
DEPENDABLE HYDRAULIC THERMOSTAT
WIDE AREA HEATER
the "INSIDE" tells the story of low-cost ovens...

PRECISION-THELCO since 1903

It's what you don't ordinarily see that makes the big difference in Precision-Thelco Ovens. Features like heater controls that hold temperatures accurately, all-welded steel construction, fully gasketed doors that close vapor tight, yet are safety latched to release dangerous internal pressures. The heater, protected from spilled liquids by its diffuser plate cover, is designed for extra quality at no extra cost. Made of long-life nickel-chromium wire, it extends over the entire oven base area to promote uniform heating.

Precision-Thelco Ovens are another example of how **good design has made possible manufacturing efficiencies that are passed on to you in remarkably low selling prices.** There's a complete Thelco line including vacuum ovens, drying ovens and incubators. All are in stock, ready for shipment. Write today for a free copy of Catalog No. 331A which has all the details.

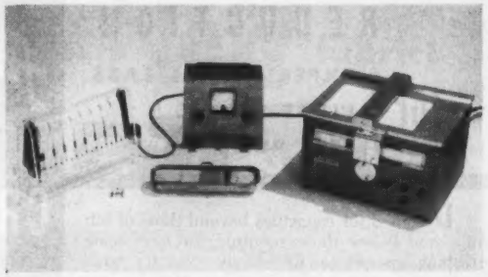


FOR BAKING • CONDITIONING DRYING • PRE-HEATING STERILIZATION • HEAT TREATING • FROM 5 ABOVE ROOM TEMPERATURE TO 180 C.

Precision Scientific Company

3747 WEST CORTLAND STREET
CHICAGO 47

When inquiring check CP 5182 opposite last page



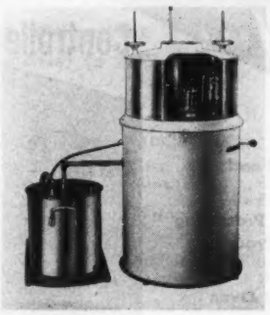
Electronic curve-drawing integrator is to right of electrophoresis cells

of run. For two-dimensional electrophoresis, rack arrangement permits use of square sheet of paper with holes on all four sides. Equilibrium channel built into cell base automatically equalizes electrolyte level in electrode chambers.

(Spinco Mod R Paper Electrophoresis System is a product of Specialized Instruments Corp., Dept. CP, 629 O'Neill Ave., Belmont, Calif. . . . or for more information check CP 5183 on handy form opposite last page.)

Stainless steel lab washer handles up to 800 vials and bottles hourly . . .

attendant may control length of wash at six successive washing stations



Uses: For washing vials and bottles up to 1000 cc. Rated capacity of unit is 800 containers hourly.

Features: Detergents, filtered tap water, air, steam, de-ionized or distilled water can be included in washing sequence. Manually-operated indexing lever moves bottles from station to station and allows attendant to control length of wash.

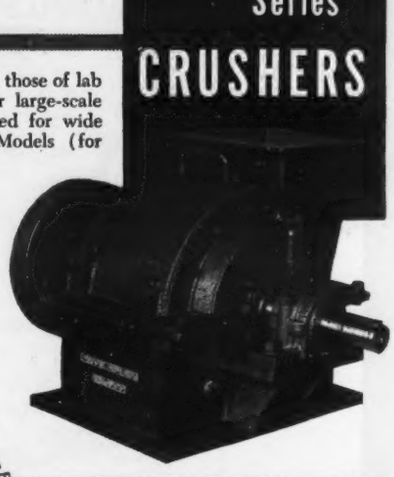
Description: Unit is 5′ tall and 27″ in diameter with weight of 267 lb. Reclaim system for recirculating detergent can be provided as optional equipment. System consists of stainless steel tank, pump, motor, and fittings.

(Mod HRW Ampwash is a product of Popper & Sons, Dept. CP, 300 Fourth Ave., New York 10, N.Y. . . . or for more information reader may simply check CP 5184 on handy form opposite last page.)

PRECISE REDUCTION
for { EXPERIMENTAL LABS / PILOT PLANTS / TEST RUNS

American No. 13 Series CRUSHERS

Designed for capacities beyond those of lab mills and below those required for large-scale crushing operations. Effectively used for wide range of materials. Up-Running Models (for maximum fines); Down-Running (for minimum fines). Equipped with rings or any of a full variety of hammers. Backed by over 40 years' experience in building reduction equipment. Write for Catalog on "13" Series Crushers.



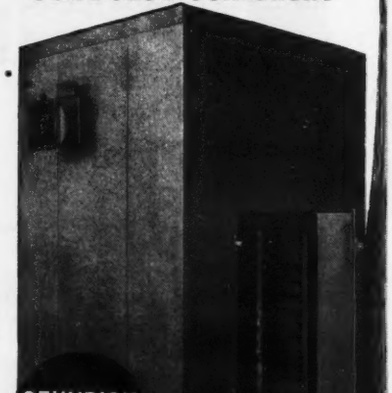
FREE Laboratory Service

Send material sample for test reduction and recommendations for reduction equipment.
No obligation.

American PULVERIZER COMPANY
1241 MACKLIND AVE. • ST. LOUIS 10, MO.

When inquiring check CP 5185 opposite last page

Evaporate... Bake... Dry... at 200° to 1000° F. under Controlled Conditions



- Electric Heating
- Heated Air Filtered and Recirculated
- Closely Controlled Processing Temperature and Product Uniformity
- Corrosion Resistant Oven Construction

Made in wide range of batch type ovens for tray or shelf loading. Available also in steam, gas or oil — direct or indirect heating. Write for Catalog.

GEHNRICH OVENS

ROCKWELL SINCE 1888 BUILT

W. S. ROCKWELL COMPANY
FURNACES • OVENS • BURNERS • VALVES • SPECIAL MACHINERY
2205 ELIOT STREET • FAIRFIELD, CONN.
Sales Representatives in Principal Cities

When inquiring check CP 5186 opposite last page

LABORATORY

Black mercury column in lab thermometer aids reading

Rapid, clear-reading of thermometers is provided by line of laboratory instruments which use black-reading mercury. Instruments present jet-black thread against white background, nullifying confusing exterior reflections of conventional mercury thermometers.

(Quiksite thermometers are a product of H-B Instrument Co., Dept. CP, American & Bristol Sts., Philadelphia 40, Pa. Check CP 5186A opposite last page.)

Reagent indicates redox endpoints clearly . . .

shows Beer-Lambert curve for traces of iron

Reagent for iron analysis known as ortho-phenanthroline is now available. Chemical may be used in titration of ferrous sulfate in presence of ferric ions or in other instances where iron-complexing agents do not follow Beer-Lambert Law. Reagent gives clear and distinct redox endpoints.

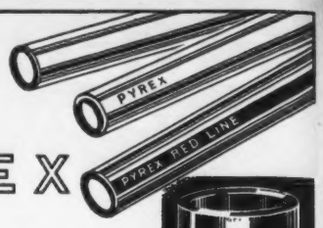
For analysts who prefer to order indicators already in solution, ortho-Phenanthroline-Ferrous Sulfate Complex is available in M/40 solution, known as Ferroin Solution.

(Reagents are manufactured by Fisher Scientific Co., Dept. CP, 717 Forbes St., Pittsburgh 19, Pa. Check CP 5187, opposite last page.)

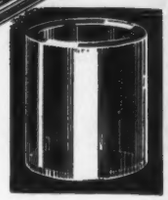
Describes, illustrates electrophoresis unit

Eight-page brochure describes Tiselius electrophoresis apparatus. Illustrations include typical serum patterns.

Bul on Model 38-A Electrophoresis Apparatus is issued by The Perkin-Elmer Corp., Dept. CP, Norwalk, Conn. Check CP 5188 opposite last page.



PYREX
GAUGE GLASS & CYLINDERS



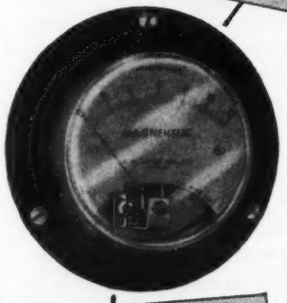
furnished in any length or finish

● For fast service on Pyrex Tubular Gauge Glass, contact Swift! We can supply Tubular Gauge Glass or Cylinders from stock in any length or finish . . . 2 mm. O.D. to 7" O.D. . . . for chemical, pharmaceutical or industrial applications. Write, wire or phone for immediate delivery.

SWIFT Glass Division
SWIFT LUBRICATOR COMPANY, INC., ELMIRA, N.Y.
330 Tenth St., San Francisco 3 • 140 Boylston St., Boston 16
807 Mateo St., Los Angeles.

When inquiring check CP 5189 opposite last page

"MAGNETIC COUPLING" Exclusive Feature of DWYER MAGNEHELIC PRESSURE GAGE



The unique design cannot be harmed by sudden pressure surges, shock loading or severe vibration. For accuracy, sensitivity, and long service life the Dwyer Magnehelic Gage cannot be equalled.

Extreme accuracy results from the elimination of friction between the flexible diaphragm and the indicating mechanism. A magnetic force transmits pressure fluctuations to the 3½" easy-to-read dial of the Dwyer Magnehelic Gage.

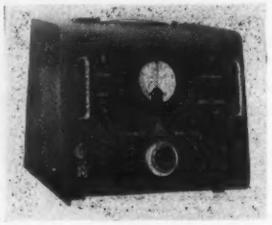
Send for Bulletin No. 250 for complete description today.

A Precision Instrument Sensitive to Pressure, Pressure Differentials or Vacuum from 0-1" water or 0-2 psi.

DWYER Specialized INSTRUMENTS and GAGES
F. W. DWYER MFG. CO. • 335 SO. WESTERN AVE. • CHICAGO 12, ILL.

When inquiring check CP 5190 opposite last page

Rugged, portable voltmeter has sensitivity greater than 5 mv



High resolution voltmeter is designed for measuring extremely low DC voltages. Instrument has sensitivity greater than 5 mv when used as electronic null-indicator. As a comparison bridge, it will measure resistive differences to accuracy of 0.01%. As current meter, using small accessory shunt box, readings are possible in milli-microampere range.

Specifications for Mod LVM-5 include: **accuracy** of ±0.1% of reading; **voltage range** 0-100v DC; resolution, at least 50 mv between 0 and 1 v; 500 mv between 1 and 10v; 5 mv between 10 and 100v; and **linearity,** better than 0.05%.

(Mod LVM-5 voltmeter is a product of Computer Company of America, Div. of Bruno-New York Industries Corp., Dept. CP, 149 Church St., New York 7, N. Y. . . . or for more information check CP 5191 on handy Reader Service slip located opposite last page.)

Safety pipet filler eliminates danger of burns or poisoning of mouth pipetting. Apparatus may be used for transferring radioactive, corrosive, toxic, infectious, or ill-smelling liquids. Unit has measurement precision of 0.01 cc. Withdrawal and delivery of fluids can be made with one hand because of three agate-ball valves which operate independently.

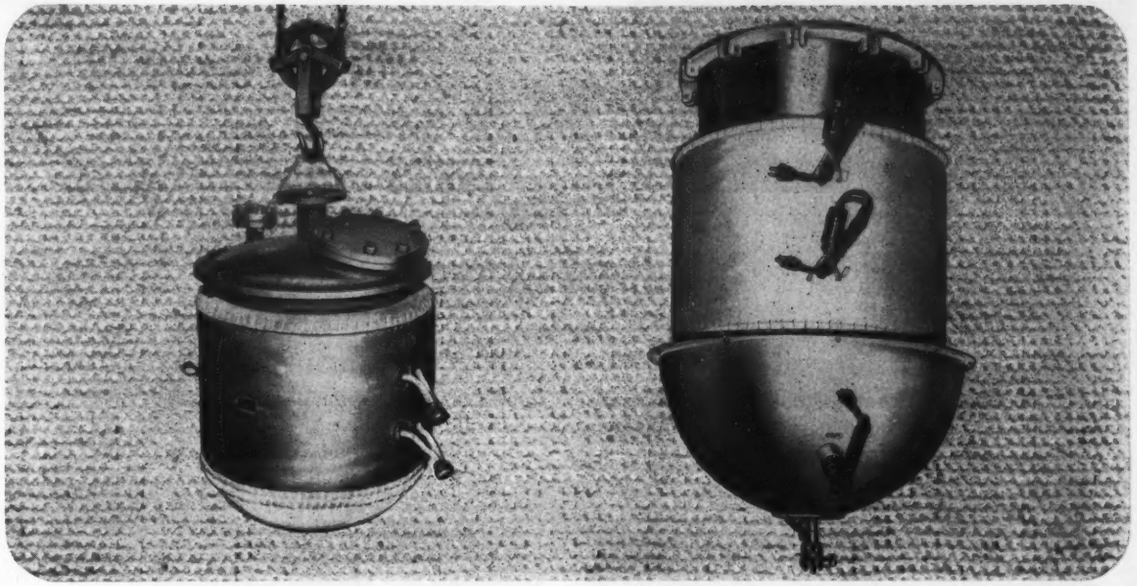
(Propipettes are products of Instrumentation Associates, Dept. CP, 17 W. 60th St., New York 23, N. Y. . . . or for more information check CP 5192 on handy form opposite last page.)

. . . for rough handling a New Heating Mantle

. . . made with tough New fabric!

the GLAS-COL "R"

("R" for rugged)



. . . for rugged, punishing use at temperatures to 650 C
—virtually eliminates fabric breakage
. . . for pilot and production plant applications
. . . for large equipment with capacities to 200 gallons

The new 650C GLAS-COL "R" represents one of the most important advances in electric heating mantle design and construction in many, many years.

These mantles are made of a remarkable, wear-resisting and break-resisting fabric developed and thoroughly tested by GLAS-COL's design and engineering staff. GLAS-COL "R" Mantles will definitely stand up under hard usage and rough handling . . . they're ideal for large equipment used in pilot and production plants. Fabric breakage, sometimes experienced with conventional 650C quartz fabric mantles, is minimized . . . practically eliminated.

The new 650C GLAS-COL "R" has many uses and applications including:

- Distillation of chemicals
- Vapor-phase cracking in tubes
- Curing of rubber and plastic materials (blankets for curing chambers)
- High temperature drying and baking of enamels and paints
- Annealing glass, plastic, or metal
- Roasting and drying of catalysts
- Roasting food products such as coffee or peanuts (blankets for roasting beds)
- Heat treating of textiles

If you have a pilot or production plant application that calls for controlled heating to 650C, investigate the new GLAS-COL "R" electric heating mantle. Write for detailed information.

Glas-Col Apparatus Co., Inc., Dept. CP, 711 Hulman St., Terre Haute, Indiana.

U. S. Patent No. 2,231,506 U. S. Patent No. 2,282,078

GLAS-COL Electric Heating Mantles

Trademark Registered U. S. Patent Office

SPECIALISTS IN LABORATORY AND PILOT PLANT HEATING PROBLEMS

When inquiring check CP 5193 opposite last page

Have you wondered why this magazine comes to you ...without charge?

MAYBE, LIKE MANY others, you've always thought that all publishers make their money, or much of it, from the subscriptions they sell.

'Tisn't so . . .

. . . no, 'tisn't so. With the exception of a few general magazines (e.g. READER'S DIGEST) that sell hundreds of thousands – some millions of copies – most industrial publishers with relatively small circulations actually lose money on their subscription sales.

Then how do industrial publishers make money? As you can guess, they make it from the advertising they sell. *Total subscription sales are hardly a "drop in the bucket" compared to advertising revenue.*

Advertisers demand best coverage

Since advertisers pay the bills, they demand best possible coverage of all important men in the field. So it's up to the publisher to publish the most readable magazine possible . . . then to insure coverage of the maximum number of the best readers.

You can't do that by selling subscriptions – sales costs are high – a large share of the subscribers cancel each year – and no matter how much time, money, and pressure is used there are always some of the important men who will never buy.

As you can see, the most effective method of getting the kind of coverage advertisers want is (a) to hand-pick the most important men; (b) send the magazine to ALL these men; and (c) to make the magazine so interesting, so valuable that they will want to read it.

That's why . . .

. . . Chemical Processing is sent only to qualified readers . . . selected management and technical key-men in the chemical industry; that's why you get Chemical Processing free – that's why we spend thousands of dollars on each issue to make it worth your time to read it. For you are an important reader in the chemical processing field.

Chemical Processing

Published by Putman Publishing Company

Creators of PUTMAN-STYLE Magazines
. . . terse, vital editorial; "hand-picked" circulation; square, high-visibility format; quality readership; hence more READER ACTION

PUTMAN PUBLISHING

CCA NBP

FOR THE LABORATORY

Shake or two on instrument shows per cent O_2 or CO_2 in a jiffy . . .

permits fast, accurate analysis of air leakage in gas lines or check of furnace atmospheres

Uses: Designed for checking efficiency of oil, gas, or coal-fired furnaces, boilers; for analysis of air leakage in gas lines, or other applications where oxygen or carbon dioxide content of gas must be known.

Features: Portable, hand-held unit is simple to operate and gives results directly to nearest ¼% of O_2 or CO_2 present in sample.

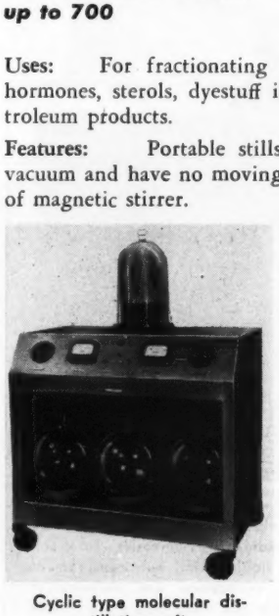
Description: Rubber hand pump is connected to gas source by rubber tubing. Pump forces sample gas into hand-held bomb. A shake or two and indicator registers per cent of carbon dioxide or oxygen present in sample. Same instrument may be used to analyze for either gas; only chemical absorbent must be changed.

(Kwik-Chek gas analyzers are a product of Burrell Corp., Dept. CP, 2223 Fifth Ave., Pittsburgh 19, Pa. Check CP 5195 opposite last page.)

Handles hard-to-distill compounds with molecular weights up to 700

Uses: For fractionating vitamin concentrates, hormones, sterols, dyestuff intermediates, and petroleum products.

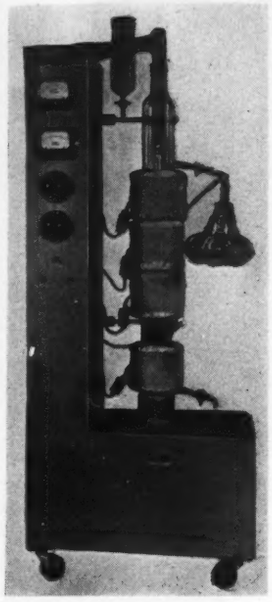
Features: Portable stills operate under high vacuum and have no moving parts with exception of magnetic stirrer.



Cyclic type molecular distillation unit

Description: Units are available in either cyclic or pot type stills. Cyclic model handles liquids and solids with molecular weights above 250. Pot type still is suitable for hard-to-distill liquids with molecular weights up to 700. Model C (cyclic) will fractionate vitamin concentrates, hormones, sterols, dyestuff intermediates, and petroleum products. It delivers products either as concentrate or derived distillate, and allows preliminary passes to be made prior to fractionation.

Feed material is drawn into degassing chamber inside evaporation chamber which is enclosed by heavy gage glass bell jar. Liquid drops to heated circular channelled distillation plate where it is vaporized as it flows by gravity around grooved concentric channels. As distillate vaporizes from plate, it is condensed by cooler inner walls and flows to gutter below plate and into distillate flask. Residuum passes automatically to residue flask.



Pot type molecular distillation unit

Flow can be controlled accurately from one drop per minute to 1 liter per hour. Vapor pressure from 1000 microns Hg to 1, and temperature range from 0 to 300°C is provided for on control panel.

Model P (pot still) combines in a single unit all necessary pumping, heating, stirring, controlling, and collecting equipment for vacuum batch distillation and fractionation at moderate or high vacuum. With the exception of magnetic stirrer, there are no moving parts in unit.

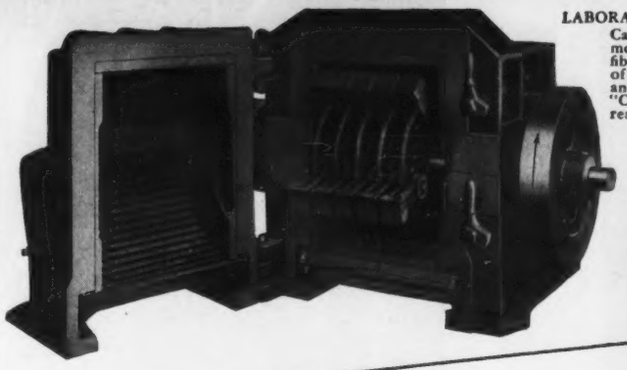
Model C is 2 feet deep, 40 inches wide and 54 inches high including bell jar distilling head. Model P is 18" wide, 28" deep, 74" high.

(ASCO Model C and P molecular distillation units are available from Bronwill Scientific, Inc., Dept. CP, 45 Russell St., Rochester 7, N.Y. . . . or check CP 5196 on handy form opposite last page.)

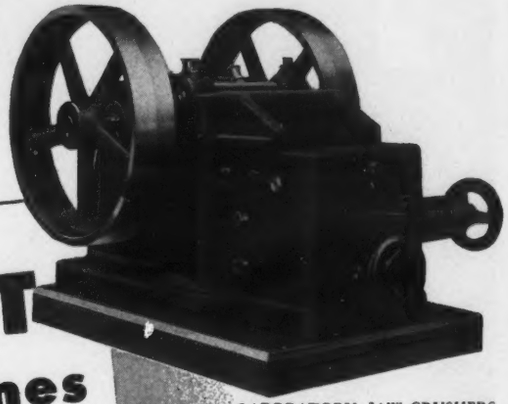
Outlines ASTM test methods for engine antifreezes

Sponsored by ASTM Committee D-15, bulletin contains ten ASTM standards pertaining to engine antifreezes. Test methods for determining freezing point and boiling point, ash content, specific gravity, pH, and water content of antifreezes are included. Booklet is 48 pages, 6 x 9", with heavy paper cover.

ASTM Standards on Engine Antifreezes may be obtained by remitting $1.25 to American Society For Testing Materials, Dept. CP, 1916 Race Street, Philadelphia 3, Pa.

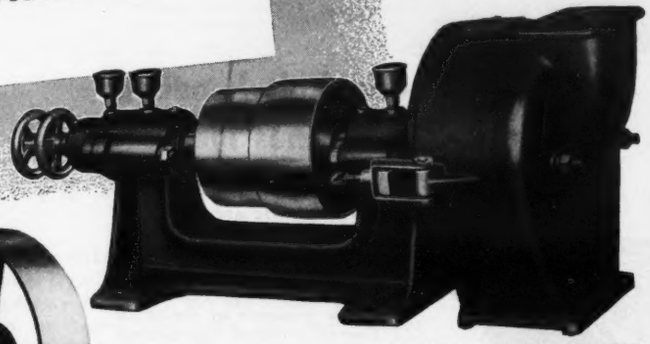


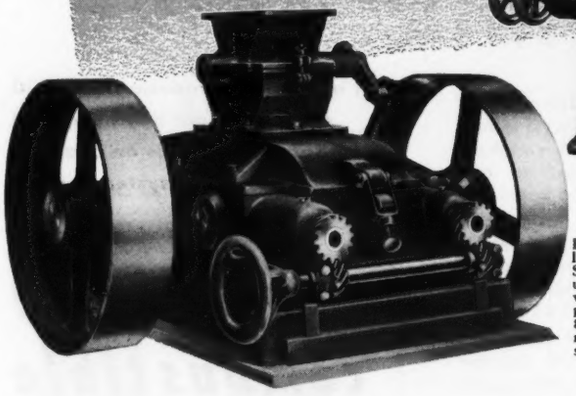
LABORATORY SWING-SLEDGE MILLS
Capable of reducing soft, moderately hard and tough or fibrous materials to any degree of fineness between 1 in. and 20 mesh. The patented "Open-Door" feature permits ready accessibility for cleaning.



STURTEVANT
Laboratory Machines
Assure Quality of Products
Fast - Economical - Accurate

LABORATORY JAW CRUSHERS
Special Roll Jaw action simplifies close regulation of the product with capacities varying from 300 or 400 lbs. per hour at finest settings, to 1000 or 2000 lbs. when opened for coarser work. Each part of the crusher is accessible for quick and easy cleaning.





LABORATORY CRUSHING ROLLS
First designed especially for laboratory sampling work, Sturtevant Crushing Rolls are used regularly in many plants where there are limited outputs. Range of output for the 8 x 5 size is from ¼ in. to 20 mesh — and for the 12 x 12 size from ¾ in. to 20 mesh.

LABORATORY SAMPLE GRINDER
Laboratory Sample Grinders are of the "Open-Door" disc type and are capable of very fine work, producing products as fine as 100 mesh (coarser if desired) when working on dry, friable, soft or moderately hard materials. Simply turn hand wheel to provide product regulation from 10 to 100 mesh.

The only sure way to maintain strict quality of products is laboratory control . . . and that calls for accurate sampling.

Sturtevant Laboratory Equipment meets the exacting requirements of laboratory work. They are fast and accurate . . . provide true samples.

Rugged and dependable, Sturtevant equipment actually has all the features of full size machines plus extra accuracy and wider range of adjustment. The "Open-Door" accessibility permits quick, thorough cleaning . . . prevents the possibility of previous batches from contaminating new samples.

Investigate Sturtevant equipment for your laboratory. It will cut your sampling costs . . . help maintain strict quality of products . . . increase sales. Write for complete details and catalog.

STURTEVANT MILL COMPANY

119 Clayton Street, Boston 22, Mass.

Designers and Manufacturers of: **CRUSHERS • GRINDERS • SEPARATORS • CONVEYORS • MECHANICAL DENS and EXCAVATORS • ELEVATORS • MIXERS**

When inquiring check CP 5197 opposite last page

Edmont Case No. 562: Unloading tank cars of ammonia solution and repairing ammonia lines, rubber dipped gloves lasted 14 shifts. Edmont Neox (reinforced neoprene) coated gloves wore 30 shifts.

Job-fitted for chemicals handling . . . wore 2 to 8 times longer

Fully coated styles for liquid-proof service.

Modern job-fitted gloves of coated fabric are replacing canvas, leather and unlined rubber gloves for handling all types of chemicals, also sharp, abrasive or slippery materials in the presence of grease or thermal extremes. Cost savings of 40% to 70% are usual. They also have excellent flexibility and grip, are comfortable, improve safety conditions, job efficiency and worker attitude.

Palm-coated styles for general work handling.

Edmont Case No. 349: Leading powder company, in test of Redmont Neox coated gauntlet, reports "These gloves outlasted type we have been using at least 3 to 1, are more comfortable and cause less chafing and irritation."

Edmont Case No. 437: Handling materials in pentachlorophenol, rubber coated gloves lasted less than 1 shift. Edmont Grappler gloves, coated with Durox plastic, wore 8 shifts.

Make this test at our expense: Edmont's laboratories have developed and test-rated over 50 types of coated work gloves to fit different job conditions. Send description of your operation. We will recommend and furnish free samples for you to test.

Edmont Manufacturing Co., 1204 Walnut St., Coshocton, Ohio

World's largest maker of coated industrial gloves, available through leading industrial suppliers.

Edmont

Edmont job-fitted gloves

When inquiring check CP 5198 opposite last page

All gas used in operating plant is produced in digester tanks, each 90 feet in diameter and 23 feet deep. Tanks are installed in two rows of five each. This is view down main corridor between tanks

In operations producing 350,000 cu ft of gas per day important safety feature is an analyzer system for . . .

detecting combustible gas leaks

System helps protect personnel, saves electricity used in ventilation, and provides continuity of operation

Because it produces, handles and stores between 325,000 and 350,000 cubic feet of highly combustible gas daily, detection of leaks in piping, valves, meters and storage tanks is an important operation at Canton, Ohio's modern new $3,500,000 sewage and garbage treatment plant.

The digester building, housing 10 primary and secondary digester tanks, is equipped throughout with spark-proof motors, explosion-proof lighting fixtures and similar protective accessories. In addition, protection of personnel and property is strengthened by a combustible gas analyzer and alarm system. Since operation of plant depends entirely on gas produced, the system also provides a safeguard against interrupted service.

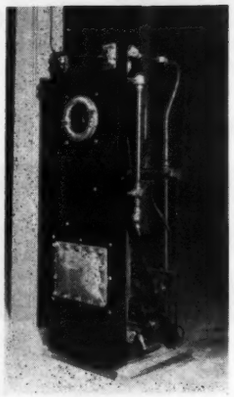
Designed and developed by Mine Safety Appliances Company, the system at Canton is arranged to draw air samples from four strategically located points between two rows of 90-foot-diameter, 23-foot-deep reinforced concrete digester tanks.

Air is drawn from sampling locations to analyzer through copper tubing by turbo-compressor pump, powered by a ¼-hp explosion-proof motor. Here samples pass over a detector filament which instantly determines percentage of combustible gas present.

If methane — principal constituent of sewer gas

— in the sample reaches 40 per cent of its lower explosive limit, instrument automatically energizes an alarm horn. Red indicator light on the panel simultaneously flashes exact location from which contaminated sample was taken.

Added advantage of system is control of exhaust fans in digester building. Although equipped with switches for manual operation, fans are ordinarily set to go into action only when analyzer detects combustible gas concentrations. This conserves electricity because fans only operate when the atmosphere is contaminated. Each sampling location has one fan recessed in concrete roof of the building which discharges to outside through hoods with flashback arrestors.



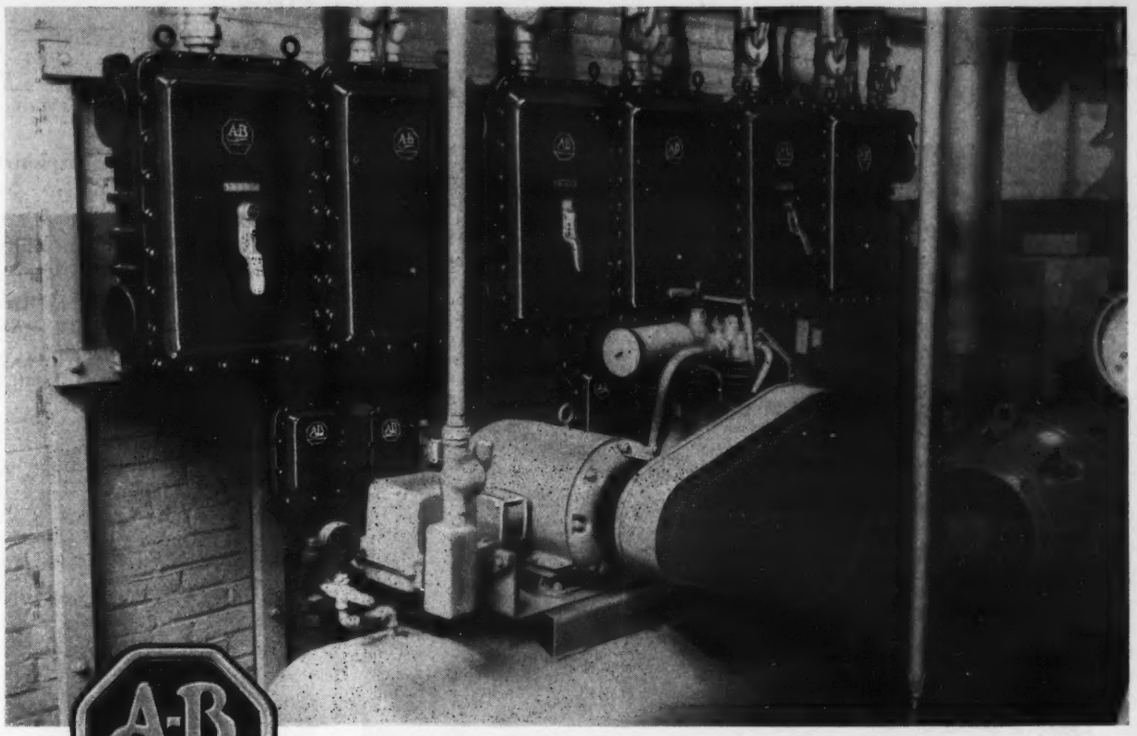
Top of digester building, showing floating steel covers on two secondary digester tanks. Primary tanks are buried in foreground. Visible here also are hoods of four exhaust fans actuated by combustible gas alarm and analyzer system

Continuous sampling and analysis of atmosphere in digester building is handled by this instrument. If any of the samples from four locations contain excess methane alarm is sounded and fans start operating

Analyzer is checked periodically with a known concentration of methane gas. Built-in air flowmeter, readable on the instrument panel, indicates to inspector that the air samples are passing through unit properly.

Gas produced in digester tanks has an average of 600 Btu content. It is used for heating buildings and water and for fueling engines that drive blowers and pumps. The plant has three 390-hp, three 200-hp, and two 90-hp gas-fired engines which are located in main administration building. Based on a commercial rate of 40 cents per thousand cubic feet, estimated savings from use of sewer gas is $120 per day. Because an uninterrupted supply of gas is essential to plant's

(*Continued on page* 141)



A-B Quality

The Sign of
QUALITY
MOTOR CONTROL

SAFE PLANT OPERATION
with **SAFE MOTOR STARTERS**

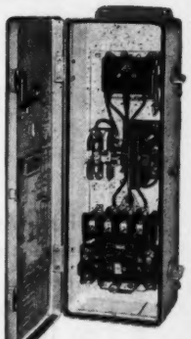
In this antibiotics plant, motor starters with NEMA Type 7 explosion proof enclosures were necessary to satisfy the fire code. Such cast iron enclosures have wide machined flanges and many bolts to assure a gastight seal.

Because all Allen-Bradley solenoid motor starters use double break, silver alloy contacts—which are always in good operating condition—frequent inspection is unnecessary. Only one moving part—assures trouble free operation.

It costs time and money to "open" bolted enclosures. So, install Allen-Bradley starters—and forget them. You'll be "safe" with only a rare inspection. Let us send you a copy of the 6th Edition of the A-B Handy Catalog.

Allen-Bradley Co.
104 W. Greenfield Ave.
Milwaukee 4, Wis.

In Canada—
Allen-Bradley Canada Ltd.
Galt, Ont.



Bulletin 712 Automatic Combination Starter in a NEMA Type 12 enclosure for protection against dirt and oil.

Bulletin 713 Circuit Breaker Type Combination Starter in NEMA 7 Enclosure.

Bulletin 709 Solenoid Starter in NEMA 7 Enclosure.

Bulletin 712 Combination Starter with Disconnect Switch in the NEMA Type 4 watertight and weatherproof enclosure. Rubber gasket seal.

Reliable overload protection provided by all A-B starters.

ALLEN-BRADLEY
SOLENOID MOTOR CONTROL
QUALITY

When inquiring check CP 5199 opposite last page

NO MAGIC
to economical work clothing

DYNEL'S economy in use
is a matter of **FACT**

THE FACT IS: DYNEL is completely unaffected by most chemicals, is mothproof, mildewproof and fire resistant.

In wear tests, DYNEL industrial clothing has outworn garments of other fibers in the same service by as much as 10 to 1. Its strength – wet or dry – high abrasion resistance and chemical resistance assure long laundry life. Available in a range of weights and constructions suitable for indoor and outdoor wear. For list of manufacturers, write us direct.

Textile Fibers Department, Carbide and Carbon Chemicals Company,
A Division of Union Carbide and Carbon Corporation
30 East 42nd Street, New York 17, New York

USE-ECONOMY will tell . . . it's DYNEL

UNION CARBIDE'S CHEMICAL-RESISTANT FIBER

When inquiring check CP 5200 opposite last page

Provides safe handling of dangerous liquids

Uses: For handling explosive or flammable liquids.

Features: Can has self-adjusting protective guard cap which prevents leakage if upset.

Description: Safety cans have been approved by UL and Factory Mutual for handling and storing oil, gasoline and similar liquids.

They come in five sizes 1 and 2 qt and 1, 2½ and 5 gal. Three smallest sizes feature one-hand trigger-grip handle. Two largest have free-swing handles.

(Cans are a product of Eagle Mfg. Co., Dept. CP, Wellsburg, W. Va. . . . or for more information check CP 5201 opposite last page.)

Shows safety device for lockout

Illustrated two-color leaflet pictures and describes safety multiple lockout device.

Leaflet on #50 Multiple Lockout is issued by Industrial Products Co., Dept. CP, 2820 N. Fourth St., Philadelphia 33, Pennsylvania. When inquiring specify CP 5202 on handy form opposite last page.

Now! for greater safety

New Safety GRIP-STRUT stair treads custom made to your exact size . . . Here for the first time is a really SAFE stair or ladder step, combining the proven features of Safety GRIP-STRUT material with a double locked carrier plate to provide additional safety over present types.

Made to your own individual size at the factory, the cost is amazingly low . . . you can buy a standard 18" stair tread in lots of 50 for $2.40 each. Prices proportionately lower in greater quantities.

Distributors in all principal cities. Consult your classified telephone directory.

GRIP-STRUT division
The Globe Company
Manufacturers since 1914
4006 S. Princeton Ave. • Chicago 9, Illinois

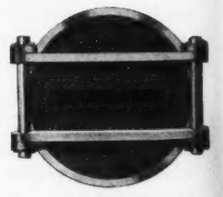
When inquiring check CP 5203 opposite last page

THE NEW LENAPE-LACY
quick opening tight sealing MANWAY

Remove one pin — and swing it open! Close — drop the pin in place — it's sealed!

Here is a manway that can be opened in a few seconds — yet can't open accidentally. The Lenape-Lacy design also *provides positive sealing* which seats more tightly with increasing pressure; and the molded *gasket* of Hycar or Silicone rubber can be *instantly removed and quickly replaced.* A lip protects the gasket seat from damage.

Four frame styles are available for all normal mounting conditions in sizes (ID) of 16", 18", 20", 24", and 30" in service ratings of 150 lb., 300 lb., 400 lb., and 500 lb. Also available for pressure-vacuum cycle service.



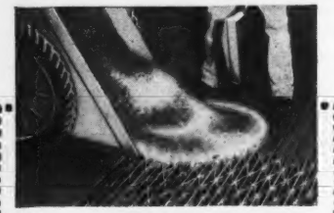
Write today for Bulletin 523 which describes the Lenape-Lacy Quick Opening Manway in detail.

LENAPE HYDRAULIC PRESSING AND FORGING CO.
LENAPE HYDRAULIC PRESSING & FORGING CO.
DEPT. 100 WEST CHESTER, PA.
RED MAN PRODUCTS

When inquiring check CP 5204 opposite last page

FLOORED BY FLOORING PROBLEMS

YOUR SOLUTION IS IRVING GRATING



For heavily abused areas:

IRVING Continuity Armouring

concrete-filled steel grating floor will not crack or break up. Inexpensive to install, it eliminates costly repairs AND IS SAFE.

Non-Sparking and Corrosion-Resistant ALUMINUM GRATING

extra-light, self-draining, self-ventilating, economical, strong and durable.

Perfect for Chemical Plants where fire is a hazard.

★

Ask about

IRVING "GRIDSTEEL"

CONTOUR RETAINER MESH for Castable Ganister Linings used in refractionating units.

IRVING SUBWAY GRATING CO., INC.

ESTABLISHED 1902

OFFICES and PLANTS at

5050 27th St., Long Island City 1, N.Y.

1850 10th St., Oakland 20, California

When inquiring check CP 5205 opposite last page

(*Continued from page* 139)

operation, the analyzer system also assures continuity of service.

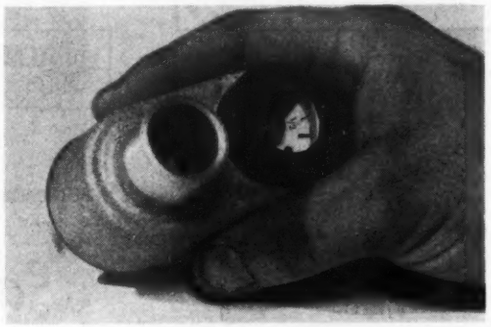
The Canton plant was designed by Alvord, Burdick and Howson, Chicago consulting engineers. It was constructed in a two-and-a-half year project by Bass Construction Co., Birmingham, Mich.

(Analyzer system is product of Mine Safety Appliances Co., Dept. CP, Braddock, Thomas & Meade Sts., Pittsburgh 8, Pa. . . . or for more information check CP 5206 opposite last page.)

With use of small measuring device good cannisters are not wasted

Good cannisters are sometimes thrown away because wearers either don't know or overstate how much they've been used.

To eliminate discarding cannister hardly used or not



Measures amount of usable gas still left in gas mask cannister after each use

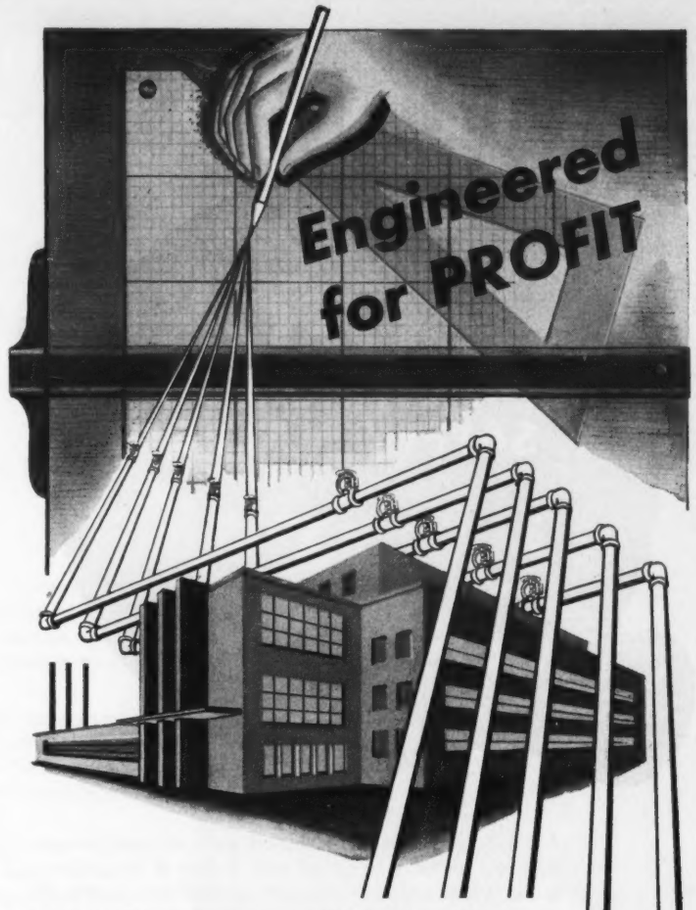
used at all, an indicator has been developed to show exactly how much of cannister's contents have been exhausted.

Unit screws into cannister cap and top of unit fits into gas mask tube. Counterspring prevents any possibility of jostling the indicator into a false reading. Construction is aluminum casing over a nickel-plated base.

(Cannister Measurer is a product of the Acme Protection Equipment Co., Dept. CP, 1219 Kalamazoo St., South Haven, Mich. . . . or for more information check CP 5207 on handy form opposite last page.)

Have a safety problem . . .?

the handy Product Directory (pages 217 to 220 in this issue) is your guide to equipment and ideas which may suit your needs.



If you, like most businessmen, are seeking a steady PROFIT builder for your business, you'll find that ENGINEERED "Automatic" Sprinkler FIRE PROTECTION is the answer.

It's an investment that returns substantial dividends whether you ever have a fire or not.

Let us show you how!

What's worth insuring is worth protecting!

"Automatic" Sprinkler CORPORATION OF AMERICA YOUNGSTOWN, OHIO

Offices in Principal Cities of North and South America

When inquiring check CP 5208 opposite last page

A quick closing emergency shut-off valve designed to automatically cut off flow out of tank in case of fire. Valve is spring-loaded and is held in open position by a fusible link which melts at 160°F. When this link melts, spring action completely closes the valve.

New features include:

1. VALVE CAGE WITH BOTTOM PORTION CLOSED TO MINIMIZE AGITATION OF SEDIMENT ON FLOOR OF TANK.
2. VACUUM BREAKER INCORPORATED IN PALLET FOR EASE OF OPENING.
3. OPERATING LEVER LINKAGE ARRANGED FOR POSITIVE MANUAL SHUT-OFF.
4. VALVE SEAT FACED WITH STAINLESS STEEL TO RESIST CORROSION.

Standard construction is steel body with bronze valve disc. May be mounted on standard A.P.I. or VAREC Fig. No. 308 Series Tank Shell Nozzles. Available with Series 15 or Series 30 Flanges. Available sizes: 4" x 6", 6" x 8", 8" x 10", 10" x 12" and 12" x 14".

"Varec"

VAPOR RECOVERY SYSTEMS CO.
2820 No. Alameda St., Compton, Calif.
Cable Address:
VAREC COMPTON, Calif. (U.S.A.) All Codes

961-F

When inquiring check CP 5209 opposite last page

Issues 1955 directory of safety posters

Directory of occupational safety posters contains 72 pages showing reproductions of available posters. Included in this directory are 744

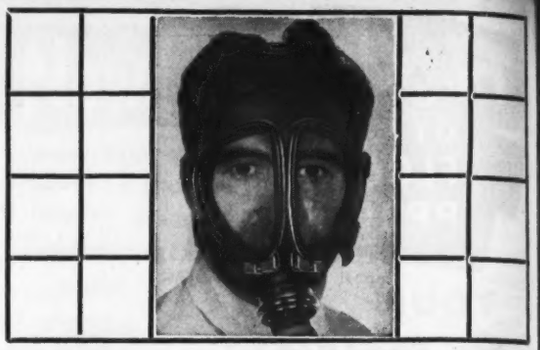
of the miniatured posters. Price list, instructions on how to use posters most effectively, and order forms are included. Illustration above is reproduction of safety poster 9124-A.

(Directory is available by remitting 50c to National Safety Council, Dept. CP, 425 N. Michigan Ave., Chicago 11, Ill.)

Gives specifications on detector

Beta-gamma discriminating radiological survey meter, designed and manufactured to Federal Civil Defense Administration specifications, is described and illustrated in two-page leaflet. Instrument can be used for general radiological protection in laboratories, industry, by community health and safety officers, and for routine checks wherever radioactivity is encountered.

Bul on Model DG-700 Geiger Counter is issued by The Atomic Center for Instruments & Equipment, Inc., Dept. CP, 489 Fifth Ave., New York 17, N. Y. When inquiring specify CP 5210 on handy form opposite last page.



ACME . the Only Gas Mask With the "PICTURE WINDOWS"

You never have that "jammed-in" feeling, wearing the Acme Full-Vision Gas Mask. Its patented, larger lenses are like picture windows, giving you full natural vision for that safe, unconfined feeling. When you walk, you can actually see your toes without bobbing your head. This factor alone makes Acme outstanding among gas masks . . . well worth looking into.

Write for the complete story on Acme Gas Masks for the chemical industry. Ask for the exclusive Acme Protection Guide listing the protection against 433 hazards.

ACME PROTECTION EQUIPMENT CO.
1219 Kalamazoo Street, South Haven, Michigan

When inquiring check CP 5211 opposite last page

AVAILABLE IN 17 PRESSURE RANGES FROM
0-30" VAC. TO 300-2500 PSI.
WITH THE SENSITIVITY YOUR APPLICATION REQUIRES

Conforms to Nema specifications 1A (semi-dust tight), 2 (drip tight), 3 (weather resistant, weather proof, splash proof, sleet proof, moisture resistant and rain tight), 4 water tight (hose test).

The cover provides for visible inspection of the sealed Mercoid mercury contact and the calibrated dial. Adjustments are external.

WRITE FOR BULLETIN 14 PW

THE MERCOID CORPORATION
4201 BELMONT AVE., CHICAGO 41, ILLINOIS

When inquiring check CP 5212 opposite last page

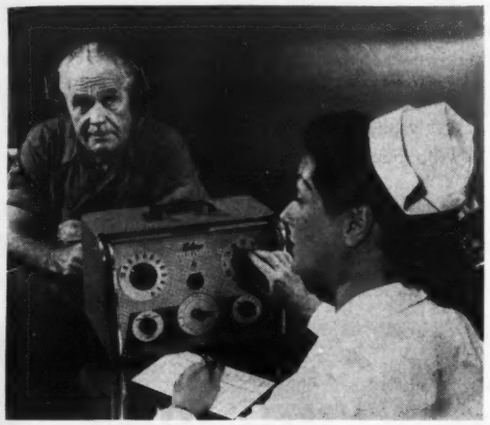
Hearing tests easy to conduct with portable instrument weighing 11 lb . . .

audiometer can test individuals or groups up to forty persons simultaneously

Uses: To provide reliable and simplified hearing tests.

Features: Instrument uses only one tube and one voltage regulator where previously up to 11 tubes were used.

Description: Audiometer weighing 11 lb has self-enclosing case with protective slide panel across its face and can be easily carried from one location to another.



Portable audiometer simplifies hearing tests

It has one bone conduction and two air conduction receivers for individual testing. For group testing it can test up to 40 persons.

(Audiometer is a product of Beltone Hearing Aid Co., Dept. CP, 2900 W. 36th St., Chicago, Ill. . . . or for additional information reader may simply check CP 5213 on Reader Service slip which is located opposite last page.)

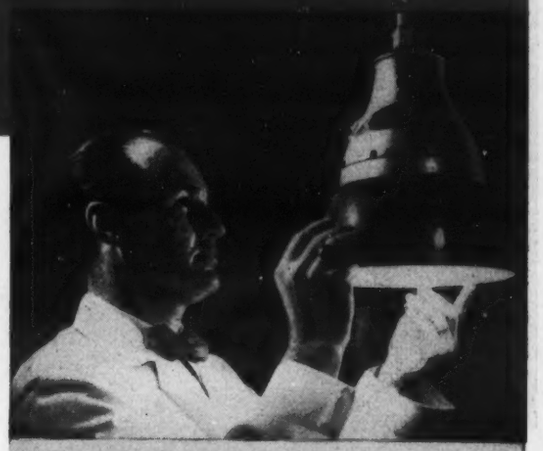
Folder shows tools and methods for halting static electricity

Illustrated two-color folder describes brushes which eliminate static electricity hazards. Brushes utilize an ionizing agent, Polonium, to nullify static electricity so that dust, lint, or other substances may be easily removed from surfaces.

"Modern Tools" folder is issued by Nuclear Products Co., Dept. CP, El Monte, Calif. When inquiring specify CP 5214 on handy form opposite last page.

Rigid testing of *Explosion-Proof* CONDULETS*

assures safety and long dependable service



Probing for maximum exterior operating temperature on a Type EVA Explosion-Proof Lighting Fixture using a multiple point recording potentiometer.

Crouse-Hinds extensive laboratories and modern manufacturing combine to give you top quality

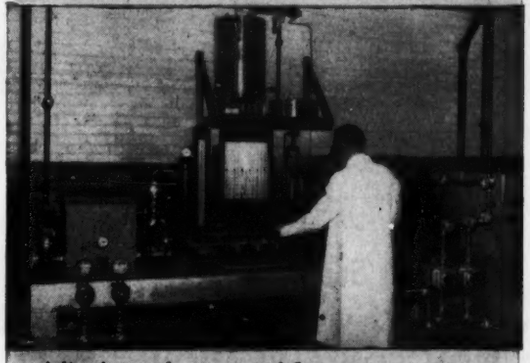
Laboratory testing is one of the key operations in the production of electrical equipment of the highest quality. Crouse-Hinds laboratories are equipped with the latest scientific instruments and staffed with expert technicians.

Products are constantly tested to make sure that they are being made to withstand field conditions. New devices are tested to predetermine their meeting or surpassing the requirements of Underwriters' Laboratories.

The photographs at the right show three of the many testing operations that are done in the Electrical Laboratory. It is equipped with apparatus for making both alternating and direct current tests, heat tests, pressure tests and many others.

Close cooperation between Crouse-Hinds laboratories and manufacturing departments is one of the reasons why Condulets have been the "Standard of Quality" for nearly fifty years.

Specify CONDULETS on every job. They're made right . . . to serve you better . . . and last longer.



Adjusting carburetors and flow meters to create a predetermined explosive mixture within an explosion-proof Condulet for an explosion test.

Photographing the pressure wave in the Oscilloscope to determine the maximum explosion pressure within an explosion-proof Condulet that is behind the concrete wall.

When quality counts . . . you can count on Condulets

CROUSE-HINDS COMPANY
Syracuse 1, N. Y.

OFFICES Birmingham — Boston — Buffalo — Chicago — Cincinnati — Cleveland — Dallas — Denver Detroit — Houston — Indianapolis — Kansas City — Los Angeles — Milwaukee — New Orleans New York — Philadelphia — Pittsburgh — Portland, Ore — San Francisco — Seattle — St. Louis — St. Paul Tulsa — Washington. RESIDENT REPRESENTATIVES Albany — Atlanta — Baltimore — Charlotte Corpus Christi — Reading, Pa. — Richmond, Va. — Shreveport
Crouse-Hinds Company of Canada Ltd. Toronto, Ont.

CONDULET — First in the field — STANDARD OF QUALITY

*CONDULETS are made only by CROUSE-HINDS

A Nationwide Distribution Through Electrical Distributors

CONDULETS · TRAFFIC SIGNALS · AIRPORT LIGHTING · FLOODLIGHTS

When inquiring check CP 5215 opposite last page

FERROFILTER®

Magnetic Separators keep lithium free from IRON CONTAMINATION

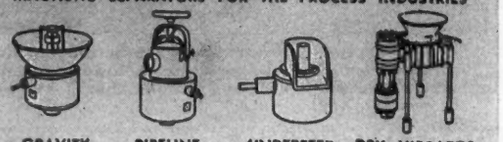
Just before bagging lithium ore, Foote Mineral Company runs this material through two Frantz Model 88V FERROFILTERS. These separators remove the smallest magnetic particles from the powdery material (as fine as 200 mesh) to assure delivery of an iron-free product. If iron contamination is eating into your profits — endangering customer good will — it's time to investigate Frantz FERROFILTERS.

Model 88V FERROFILTER with average dry material capacity of 5 to 25 tons per hour. Smaller Model 66V handles 1 to 5 tons per hour. Powerful vibrator speeds flow of coarse and fine materials.

S. G. FRANTZ CO., Inc.
P.O. Box 1138 Trenton 6, N.J.

Send for BULLETIN 46-E

MAGNETIC SEPARATORS FOR THE PROCESS INDUSTRIES



GRAVITY PIPELINE UNDERFEED DRY, VIBRATOR

When inquiring check CP 5216 opposite last page

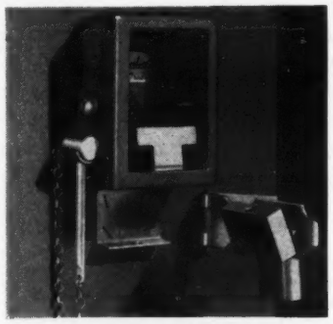
Releases locks quickly in emergencies

Uses: For quick release of locked rooms holding first aid supplies, drugs, oxygen tanks, electrical machinery or emergency equipment.

Smashing glass case in an emergency . . .

Features: Device prevents damage to doors by authorized emergency entry and can be geared to operate with fire alarm systems, tear gas or electrical machinery.

Description: Over hasp and padlock is metal case with glass door. In emergency glass is broken and spring forces hasp open below. It may be hooked in with burglar system, alarm bell, siren or light or signal to plant office.

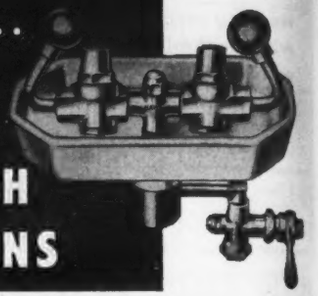


. . . opens locked doors in a hurry

(Lock release is available from American Allsafe Co., Inc., Dept. CP, 1245 Niagara St., Buffalo 14, N.Y. . . . or for more information reader may simply check CP 5217 on handy form, opposite last page.)

Approved by Safety Engineers...

HAWS EYE-WASH FOUNTAINS



• • • offer a way to more adequately protect employees' eyesight and avoid costly insurance claims... by providing a *safe* method for workers to flush injurious chemicals and particles from their own eyes *immediately*—before greater damage can be done!

And, wherever there is danger of workers' hands, face or clothing being contaminated by acids or caustic chemicals—install HAWS Emergency Drench Shower Equipment.

Cost is negligible. Ask your plumbing contractor, or write *today* for complete information.

HAWS

HAWS DRINKING FAUCET CO.
1439 FOURTH STREET • BERKELEY 10, CALIFORNIA

When inquiring check CP 5218 opposite last page

Win the Germ War!

Use PIONEER® Stanzoils®

Only a liquid-tight glove gives positive physical protection from chemicals and germs that cause hand dermatitis. Also protects products from contamination by hands.

PIONEER *milled* neoprene stands extra hours of use in contact with oils, acids, caustics, detergents and solvents—has higher tensile, greater tear resistance than any other oil-resistant rubber.

Super-safe grip creates confidence, speeds work—handles wet slippery objects as if dry.

32 PIONEER styles, weights sizes and colors. Send for Stanzoil catalog—shows quickly how to select best, most economical glove for each job.

Stanzoil N-30 Whitecaps lightweight neoprene, sanitary white. Non-slip grip, curved fingers. Length 10½".

The PIONEER Rubber Company
241 TIFFIN ROAD • WILLARD, OHIO

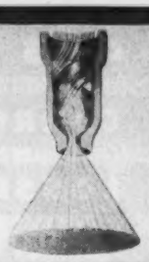
STANZOIL PIONEER

Quality Gloves for 35 Years

When inquiring check CP 5219 opposite last page

SPRAYING SYSTEMS CO.

SPRAY NOZZLES



exact performance for every need

Choice of thousands of standard spray nozzles gives you exact spray pattern, capacity, impact and atomization. PROMPT . . . often immediate delivery from stock.

BE SURE TO WRITE FOR . . . . .

the most complete spray nozzle catalog ever printed . . . forty-eight pages of detailed information. Write for your free copy of Catalog No. 24.

SPRAYING SYSTEMS CO.
3216 Randolph Street • Bellwood, Illinois

When inquiring check CP 5220 opposite last page

DRIBBLING IN BASKETBALL IS *OK*...

BUT NOT IN A
CHEMICAL PLANT

A good dribbler may be worth his weight in gold . . . in basketball, but in your plant, dribbling expensive granular fines through poor fitting bucket lips can result in costly contamination.

Blaw-Knox Chemical and Fertilizer Buckets are designed with *tight-fitting* lips to prevent leakage. They stop the dribbling away of your profits. These cast alloy steel lips also resist abrazion and prolong bucket life.

For a detailed description of the important features in Blaw-Knox Buckets, write for Bulletin 2378 today.

BLAW-KNOX EQUIPMENT DIVISION

BLAW-KNOX COMPANY
Blaw-Knox Equipment Division
Department 761
Pittsburgh 38, Pa.
Offices in Principal Cities

When inquiring check CP 5221 opposite last page

Gets fire extinguishers to scene of fire in a hurry . . .

cart can carry 3 extinguishers, save running back for more

Fire extinguisher cart transports extinguishers to fires in a hurry. It saves time lost in lifting them from wall brackets and allows one man to command more than one extinguisher at a time.

One man handles several extinguishers at one time with cart

Height of extinguisher hanger is adjustable so that cart may be made to hold a variety of extinguishers.

Cart is 46" high and requires floor space of 14 x 21½". Wheels are 10" in diameter and weight is 26.2 lb. Finish is black enamel with red enamel wheels.

(Cart is a product of American-LaFrance-Foamite Corp., Dept. CP, 101 E. LaFrance St., Elmira, N.Y. . . . check CP 5222 opposite last page.)

Gives specifications on barrier rope

High visibility plastic barrier rope is described in two-color illustrated leaflet.

Leaflet on No. 10 Plastic Barrier Rope is issued by Industrial Products Co., 2820 N. Fourth St., Philadelphia 33, Pa. When inquiring specify CP 5223 opposite last page.

CESCO *RIGHT... before your Eyes!*

NEW
Chemical Goggles

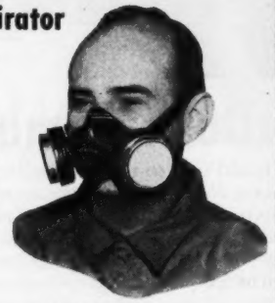
No. 100 CESCO

Moulded from black synthetic rubber with wide, soft contact surfaces to provide comfort. Perfectly contoured to fit snugly all around for complete protection. Elastic headband is easy to adjust. Full view, transparent plastic window fits in deep holding grooves. Can be replaced in a few seconds. Baffled ventilator holes on each side prevent fogging. Can be worn over most glasses.

The No. 100 CESCO Chemical Goggles are a must for anyone working in dusty air or near splashing liquids.

No. 99 Approved CESCO Respirator

A twin cartridge organic vapor respirator (BM Approved) with positive acting inhale-exhale check valves which prevent rebreathing. High breathing efficiency. Easy to install new cartridges. Converts to No. 96 (BM Approved) CESCO Dust Respirator by changing cartridges to filter pads. Buy one respirator with cartridges and filters for dual service.



Aprons and Sleeves

CESCO Aprons and Sleeves are made of Acitex, a tough, flexible, lightweight material with high resistance to acids, caustics, and splashing liquids. Withstands abrasion and strain in ordinary use. "Welded" seams eliminate all metals and stitching.

See your CESCO Safety Equipment Distributor or write for details

CHICAGO EYE SHIELD COMPANY • 2316 Warren Boulevard, Chicago 12, Illinois

CESCO FOR SAFETY

OFFICES IN: Atlanta, Birmingham, Boston, Buffalo, Cincinnati, Cleveland, Columbus, Dallas, Detroit, East Orange, Houston, Indianapolis, Kansas City, Knoxville, Little Rock, Los Angeles, Louisville, Mexico City D.F., Milwaukee, Montreal, Peoria, Philadelphia, Pittsburgh, Salt Lake City, San Francisco, Spokane, St. Louis, St. Paul, Toledo, Tulsa, Wichita

When inquiring check CP 5224 opposite last page

ACCO Registered* Slings

ACCO Quality

Don't Gamble with Safety!

• In addition to the six quality features of all ACCO *Registered* Slings, ACCO offers you the convenience of distributor stocks of popular types, diameters, and lengths of slings—and a variety of tested fittings—which handle most of your sling requirements.

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When inquiring check CP 5225 opposite last page

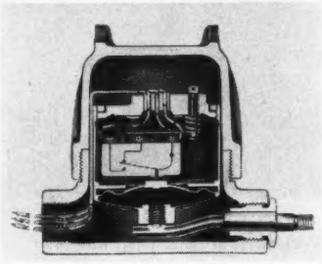
Explosion-proof housing protects pressure switches . . .

units approved for Class I and II hazardous locations

Uses: For sensing increase or decrease in pressure or vacuum at locations where dust or vapors present explosion hazard.

Features: Switches have UL approval for Class I, groups B, C and D and Class II, groups E, F, and G locations. Units operate in range from 30" vacuum to 150 psi.

Description: Accurate switches repeat within 1% of setting. Standard models are available for single or dual settings. Dual type



Switches operate in range from 30" vacuum to 150 psi

permits two limits to be set and actuates two electrically independent circuits, one AC and the other DC if desired. Units are automatically reset by snap action.

(Pressure and vacuum switches are products of Barksdale Valves Co., Dept. CP, 5125 Alcoa Ave., Los Angeles 58, Calif. . . . check CP 5226 opposite last page.)

Presents systems and data on magnetic separators

Illustrated sixteen-page catalog provides complete information on installation, technical data, specifications and available sizes of permanent magnetic separators.

Cat No. 17 is issued by Eriez Mfg. Co., Dept. CP, 13 Magnet Drive, Erie, Pa. Specify CP 5227 opposite last page.

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Cambridge, Mass.

When inquiring check CP 5230 opposite last page

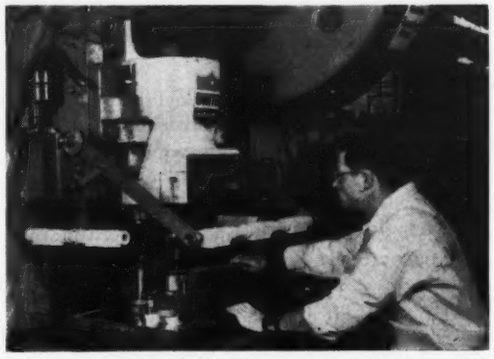
Radioactivity used in safety device— protects workers' hands, fingers from power machinery . . .

leather wrist bands prevent presses from working when hands are in danger area

Uses: To prevent power presses from working when worker's hands enter danger area.

Features: Operator cannot operate machine without safety wrist bands. Time-delay relay opens control circuit to make press inoperative whenever tubes do not detect wristbands at predetermined interval. Same time-delay protects against possible failure of Geiger tubes so they will "fail safe".

Description: Adjustable leather wristbands transmit steady multi-directional signal which is



Operator of power press is guarded against crushed arms or hands by "Bikini Bracelets"

detected as they near Geiger tubes located at boundry of danger zone. Geiger detectors activate electronic relay which locks production machinery.

Control relay contacts are wired either in clutch and brake circuit of the friction clutch presses, or to a treadle lock or over-travel device on the fast acting pin clutch presses.

No complex adjustments or mounting schemes are required for installation. Three cable connection puts equipment in operation. Only two simple controls need be set, one for range and one for time.

Control box with fail safe and anti-cheat timer is housed in standard NEMA switch-gear cabinet equipped with aircraft vibration mounts.

Geiger tube detectors are housed in standard Mougal 1" conduit junction boxes. Wrist bands are made of soft leather and are shielded to keep emission at safe level as set by authorities (1.5 rep) for hands in most states. Each band is rated at 20 mr and is shipped with a certificate.

(Safety Control is a development of the Hazatrol Corp., Dept. CP, 215 Market St., San Francisco, Calif. . . . or for more information check CP 5231 opposite last page.)

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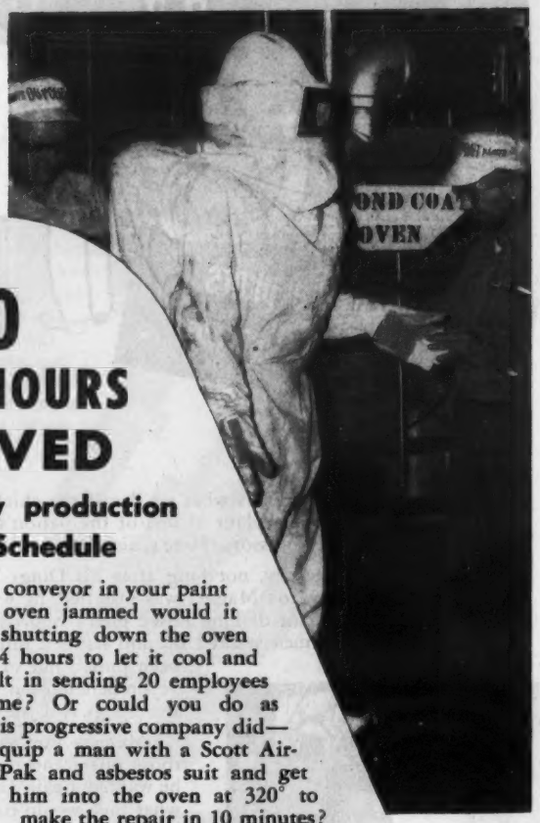

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• If the conveyor in your paint drying oven jammed would it mean shutting down the oven for 24 hours to let it cool and result in sending 20 employees home? Or could you do as this progressive company did— equip a man with a Scott Air-Pak and asbestos suit and get him into the oven at 320° to make the repair in 10 minutes? A similar, costly interruption *could* happen in *your* plant tomorrow! 200 Man Hours is a lot of time to lose in a busy production program. Better take steps now to get on that 10 minute schedule!

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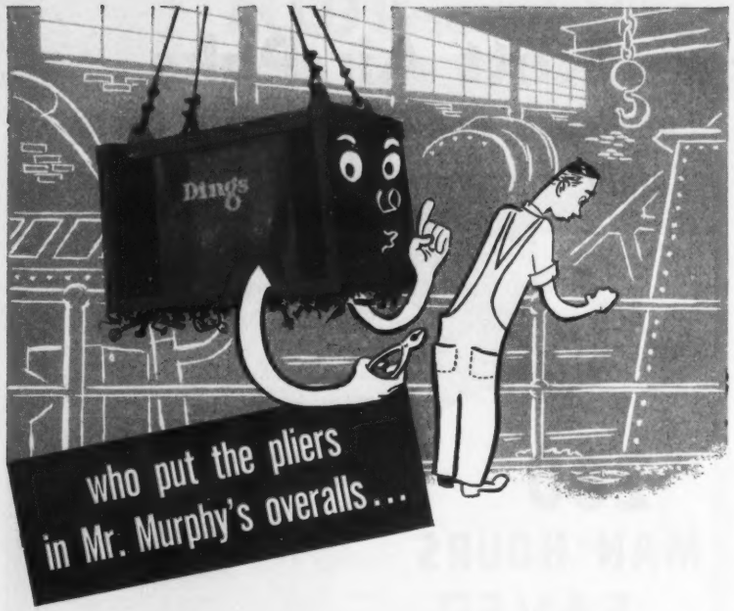
When inquiring check CP 5232 opposite last page



MURPHY is what we'll call the chief engineer in the Omaha plant of one of the nation's largest grain processors. Here's his story —

One day, not long after his Dings RM Suspended Tramp Iron Magnet was installed, he was wishing he had a pair of long nosed pliers. Shortly after, one of his men walked up and handed him a pair. They'd been pulled out of a 12-inch conveyor belt burden of corncobs by the Dings RM Magnet.

THIS IS THE MAGNET THAT CAUGHT THE PLIERS — That junk on the bottom is a typical tramp iron accumulation — crushed "tin" cans, wire. "Murphy" reports even crowbars occasionally find their way into the corncobs processed in his plant.

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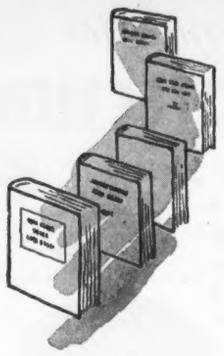

Spot Tests

Vol. I — Inorganic Applications
Vol. II — Organic Applications

Reviewed by JOYCE EVANS HILL
Mobile, Alabama

The fourth completely revised English edition of Fritz Feigl's classic has accomplished the remarkable in constituting a thorough reference for the use of spot tests in the fields of organic and inorganic analyses.

Several distinct improvements have been made over previous editions. Foremost is the addition of a separate volume that deals entirely with organic applications. Other noteworthy additions are the inclusion of many hitherto unpublished tests recently developed by the author as well as innovations in standard procedures.

Vol. I — Inorganic Applications consists of 517 pages of detailed, well-arranged tests that should be of value in every field of chemical endeavor. Especially helpful to industry and the research chemist is Chapter 7, "Spot Tests For Technical Materials." The use of equations throughout will be welcomed by beginners, advanced students, and seasoned chemists.

For each element, group, or radical to be tested, a series of test procedures with complete bibliography is given at the end of every chapter. The application of spot tests on a macro scale is not overlooked, nor is the field of chromatography ignored. Chapter 2, "Spot Test Techniques," written in collaboration with Philip W. West of Louisiana State University, is an excellent treatment of requirements for equipment, methods, and special techniques.

Vol. II — Organic Applications has been expanded from a mere supplement of inorganic analyses to a complete volume of 436 pages. The purposes of this volume are to provide a complete description of tests applicable as spot reactions in qualitative organic work and to stimulate studies that lead to a wide development of organic spot test analyses. Descriptions of over 200 tests with detections for preliminary examination, functional groups, individual organic compounds, and applications for special technical purposes are prominent features of the book. As in Vol. I, Philip W. West has contributed a chapter on spot test techniques.

This reviewer is particularly impressed with the scope of the book and the style employed by the author. This text will surely become a standard reference for organic chemists, biologists, and pharmacists alike. Both volumes are bound in flexible cover, a feature that is not of merit to a book on a shelf but which facilitates use on a desk. After all, a book on a desk is worth two on a shelf!

To obtain "Spot Tests, Vol. I — Inorganic Applications, and Vol. II — Organic Applications," remit $6.50 *and* $6.25 *respectively to Elsevier Press, Inc., 402 Lovett Blvd., Houston, Texas. When inquiring specify CP 5234 on handy form opposite last page.*

Chemical Engineering, Vol. I

Reviewed by D. S. DAVIS
Professor of Chemical Engineering
Virginia Polytechnic Institute

Coulson and Richardson, of the Imperial College of Science and Technology, London, present in Volume I an exceptionally thorough account of the fundamentals of fluid flow, heat transfer, mass transfer, and humidification. Replete with derivations that are accorded excellent mathematical analyses, the book may be a little stiffer than those to which American undergraduates in chemical engineering are accustomed. However, students with sufficient patience and fortitude to tackle the theory and check the numerous examples, which are worked out in

reviews of current technical and reference works . . . summarized for you by authorities in the field working with the CP staff

gratifying detail, are sure to attain a sound grasp of the subject.

Without relinquishing the British flavor, the authors have leaned heavily and properly on the standard American texts in the field and have undoubtedly achieved a 370-page text that is well-adapted to use in England and the colonies. Topics are logically arranged, the photographs and line cuts are good, and the generous use of heads and subheads imparts to this British book the attractive appearance that characterizes the efforts of the American publisher.

Unusually complete references are given, the indexing is adequate, and the appendix contains many good tables and line coordinate charts borrowed from McAdams' "Heat Transmission" and Perry's "Chemical Engineers' Handbook." No unsolved problems are included; teachers who adopt the text will have to supply their own, as many prefer to do anyway.

To obtain "Chemical Engineering, Vol. I" remit $7.50 *direct to McGraw-Hill Book Co., Inc.,* 330 *W. 42nd St., New York* 36, *N. Y.*

Detergency Evaluation and Testing

Reviewed by HAROLD R. SUTER
Wyandotte Chemicals Corporation

If "Detergency Evaluation and Testing," a terse little book by J. C. Harris, contains a wasted word, this reviewer has not found it. Though brief the book is quite comprehensive, through the use of well-chosen references. To anyone faced with the task of selecting detergents from the bewildering array on the market, this volume should be welcome indeed.

The author sets forth the complexities of the deterging process and describes the unsettled state of performance testing. He then advocates an intelligent balance between laboratory characterization and performance tests on the one hand, and actual service tests on the other.

For surface-active materials specific directions are given for conducting useful screening tests such as those for stability, wetting, foaming, and surface and interfacial tensions. The procedures used in the author's laboratory for evaluation of detergents for washing cotton are described in detail, and pertinent information concerning the methods of others is presented. Evaluation methods for detergents for washing fibers, metals, dishes, and painted surfaces are given, and a discussion of the use of radioactive isotopes in detergency testing is included.

This 206-page book should be a valuable tool for the detergent chemist and a great timesaver for those who take up the subject as an occasional matter.

To obtain "Detergency Evaluation and Testing" remit $3.75 *direct to Interscience Publishers,* 250 *Fifth Ave., New York* 1, *N. Y. When inquiring specify CP* 5235 *on convenient Reader Service slip located opposite last page.*

Elementary Chemical Engineering

(*Staff Review*)

Based on the theory that knowledge of fundamental principles of chemical engineering is necessary in almost any type of industrial work, Max S. Peters has written a 322-page book about chemical engineering that can be understood by readers with no previous training in the field. Book presents a unified picture of chemical engineering in simple terms. Emphasis is placed upon the development, applications, and interrelationships of the basic principles.

Starting with an overall appraisal of the profession and extending through stoichiometry, typical equipment, unit operations, chemical technology, economics, and plant design, the book gives the reader an opportunity to acquaint himself with the entire profession.

Illustrative examples are used throughout the text. Problems are given at the end of individual chapters to give the reader a chance to test his understanding of the material. Answers are given in the appendix. Book should be of value to executives, supervisors, engineers, technical salesmen, and practicing chemists.

To obtain "Elementary Chemical Engineering" remit $6.00 *direct to McGraw-Hill Book Company, Inc., Dept. CP,* 330 *West 42nd Street, New York* 36, *New York.*

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FIG. 2698

FIG. 444

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Fig. 444—Globe—OS&Y—union bonnet—screwed or welding ends
Fig. 445—Angle—OS&Y—union bonnet—screwed or welding ends
Fig. 2698—Globe—inside screw—union bonnet—screwed or welding ends
Fig. 2699—Angle—inside screw—union bonnet—screwed or welding ends

SIZES: 1¼, 1½ and 2"

Fig. 448—Globe—OS&Y—bolted bonnet—screwed or welding ends
Fig. 449—Angle—OS&Y—bolted bonnet—screwed or welding ends

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Single and Multiple Conveyor Dryers; Cabinet and Tunnel Type Truck Dryers; Extruders; Drying and Baking Ovens; Equipment for Plastic Film and other Continuous Web Processing; Test Dryers.

Right: Large Multiple-Unit, Multiple Apron Conveyor Dryer.

Below: Fourteen-Section Multiple-Unit Single-Apron Conveyor Dryer With Three-Zone Control.

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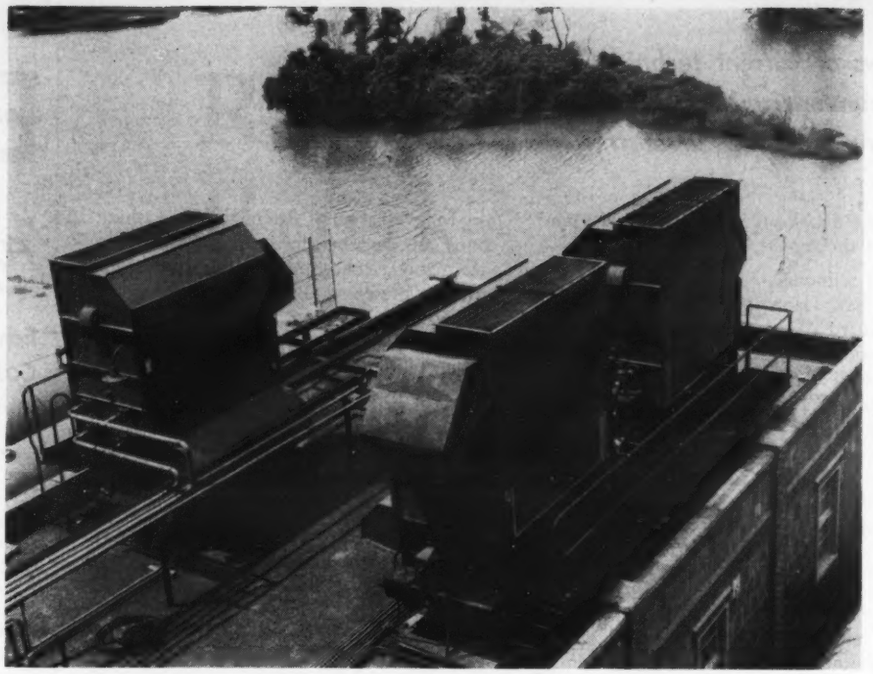

Fig 1—These three units are used for cooling recycle liquid from a distillation column

Eliminating previous fouling and corrosion, heat exchangers used at Heyden provide —

efficient cooling and condensing of organic chemicals

Evaporative cooling with air minimizes need for make-up water, decreases maintenance, results in high heat transfer efficiency and close temp control

Problem: Vertical-tube heat exchangers used at the Fords, N. J., plant of Heyden Chemical Corp. for cooling liquid reflux and for condensing vapors from a distillation column handling organic chemicals were fairly satisfactory for small capacity but were not as efficient as desired. Excessive maintenance was necessary due to corrosion and heavy fouling. Cooling couldn't be closely controlled and the heat transfer was poor.

Solution: About four years ago, plant installed three Aero heat exchangers and one Aero vapor condenser. Three heat exchangers shown in Fig 1 are used for cooling liquid reflux from column. Two units shown at right in this photograph are piped in parallel and cool reflux from the lower part of the column. These units cool 110,000 pounds per hour from 149 to 113°F.

Unit shown at left in Fig 1 cools reflux from the upper part of the column. This exchanger cools 110,000 pounds of liquid per hour from 105 to 95°F.

Vapor condenser used for condensing organic chemicals in the vapor state is shown in Fig 2. Top of three-story high distillation column extending through roof of building appears at right. Vapor is conducted to coil inlet of condenser, condensation taking place at about 14" of vacuum. This exchanger condenses 2800 pounds of material per hour at 130°F, the condensation temperature.

Material to be cooled or condensed is admitted to coil inlet header of exchanger through an external manifold. Product is cooled inside tubes, which have a continuous downward pitch to empty liquid into coil outlet header.

All coil surfaces are cooled by evaporation of recirculated water from their external surfaces into a forced air stream. In that way air is used as the

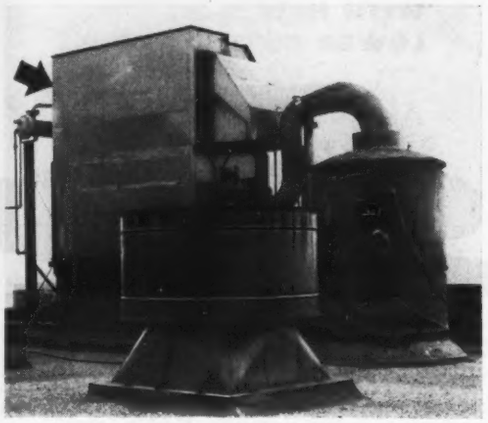

Fig 2—Unit (arrow) condenses vapors from top of distillation tower (right)

cooling medium, making it only necessary to use a negligible amount of make-up water. Fairly pure water, (city water, steam condensate) is used.

Spray eliminators placed between water spray nozzles and blower section prevent entrainment of water droplets. All spray water is recirculated by means of a vertical pump built into an extension of the spray pan. Spray pan is readily accessible and can be quickly drained and flushed without noticeable interruption of operation.

Baffles in upper section are positioned to vary proportions of fresh and recirculated air to provide cooling needed. Desired capacity is assured during extreme summer weather. Unit is protected against freezing by built-in control system.

Coils, as well as piping to and from exchanger, are stainless steel. All parts of the casing and blower section are coated with a rubber-base finish to provide corrosion-resistance for these parts.

Results: Design of heat exchangers in which evaporative cooling with air is used has resulted in high efficiency in cooling and condensing the organic chemicals at required capacities. It is estimated that 95% of the cooling water that would otherwise be required is saved. Only 15 gallons of make-up water per minute is added to all four units. Exchangers have a consistently high heat transfer efficiency.

Close cooling control is provided through built-in feature of exchangers, which compensates for changing atmospheric conditions. No evidence of fouling has been noted. Use of stainless steel piping and coils, along with specified protective coatings, has eliminated corrosion.

(Aero vapor condensers are manufactured by Niagara Blower Company, Dept. CP, 405 Lexington Ave., New York, N. Y. . . . or for more information check CP 5238 opposite last page.)

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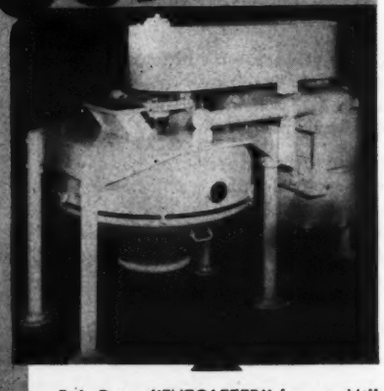

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The Safety Car Heating and Lighting Company, Inc.
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When inquiring check CP 5241 opposite last page

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has 8″ agitator, Teflon gaskets

Uses: For pilot plant and other experimental or small scale pressure reactions.

Features: Glass-lined reactor withstands maximum pressure (internal working) of 500 psi. Unit is equipped with glass-coated 8″ diameter three-bladed impeller agitator having rotary mechanical seal. Gaskets are Teflon-covered asbestos.

Description: Jacketed, vertical-dished bottom, 5-gallon reactor has 12″ diameter and is 13″ deep. Clamped-on glass-lined cover has three 1½″, one 2″, and one 2½″ (for agitator) flanged openings. Reactor is mounted on four 1½″ pipe legs, bringing bottom outlet about 25″ above floor.

Tank is equipped with 150-psi (working pressure) jacket, is complete with inlet and outlet connections, safety valve, and pressure gage. Agitator is connected to spiral bevel-gear drive with 1-hp, 1200-rpm, 220/440v, 60cy, 3-phase, totally-enclosed, explosion-proof motor. Agitator speed is about 100 rpm.

(Reactor is product of Glascote Products, Inc., Dept. CP, 20900 St. Clair Avenue, Cleveland 17, Ohio . . . or for more information reader may simply check CP 5242 opposite last page.)

Replaceable rubber inserts featured in redesigned wet cyclones . . .

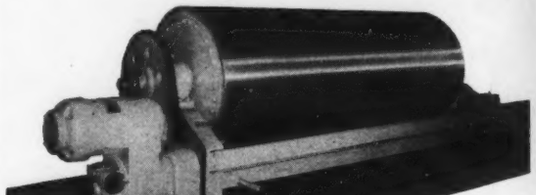
easily installed, molded parts increase operating life

Replaceable molded rubber inserts are featured in redesigned wet classification units. Linings increase operating life, are easy to install, and are less costly than equivalent parts used in old design.

Greatest modification has been in six-inch diameter unit. Rubber-lined conical casting has been replaced by two-piece cylindrical casting in-

GET DOWN LOW

WITH NEW G-B LOWER COST FLAKERS!



We can point to many instances where new G-B designs have resulted in lower overall product flaking costs, too. This double-barrelled economy in flaker equipment design deserves *your careful re-examination* of your flaking costs as a means of product conversion. Phthalic anhydride, sulphur, benzene hexachloride, caustic, and resins of all types can be efficiently and economically processed by G-B flakers.

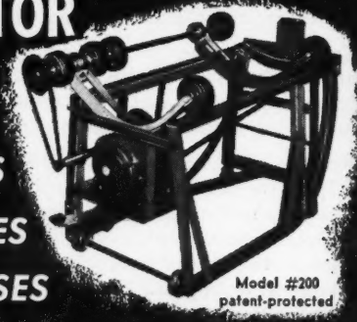
Our pilot testing facilities are at your disposal . . . no obligation.

GOSLIN-BIRMINGHAM MANUFACTURING CO., INC.
BIRMINGHAM · ALABAMA

When inquiring check CP 5243 opposite last page

inexpensive MORSE portable ROTATOR

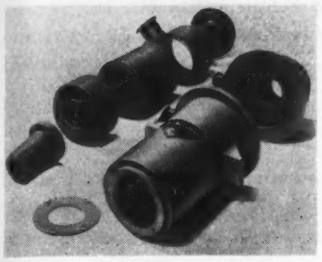
- MIXES
- BLENDS
- TUMBLES
- CLEANSES



In 30 to 55 gal. drums, 1 to 5 gal. cans at rotating speeds 10 to 40 rpm. The four drive-wheels have Neoprene treads, resistant to paint and oil. The idler wheels have Torrington Needle Bearings for smoother operation. Easily loaded—frame has retractable casters. Various speeds are secured through chain sprocket reduction. Morse Model #200 Rotator weighs 115 lb. Write for Bulletin 348 and free folder showing complete Morse line or Drum and Barrel Handling Equipment.

MORSE MANUFACTURING CO. INC.
757 West Manlius St. East Syracuse, N. Y.

When inquiring check CP 5244 opposite last page



Exploded view of 6" diameter redesigned wet classification unit. Five molded rubber liner sections forming cone fit into two-piece cylindrical casting

to which five rubber molded sections are fitted. Conical classification chamber is formed by interior shape of the two rubber cone section liners.

Other molded sections include feed chamber liner, vortex finder (available in six diameters ranging from one 2½ inches inside diameter), and an apex section (with six choices of openings ranging from ¾ to 2 inches inside diameter).

Apex section is held in position by clamp ring attached to lower casting. After remaining sections are inserted, top section is bolted to lower one, completely enclosing all rubber sections except apex section. Twelve and 24-inch diameter cyclones have also been redesigned.

(Redesigned Type FR DorrClones are product of Dorr-Oliver, Inc., Dept. CP, Barry Place, Stamford, Conn. . . . or for more information check CP 5245 opposite last page.)

Tables tell essential data of catalyst carriers

Advantages of Celite diatomite catalyst carriers are discussed in illustrated four-page folder. Essential data on each type is presented in tabular form. Close-up photographs illustrate variations of the different carriers.

Bulletin on catalyst carriers is issued by Celite Division, Johns-Manville, Dept. CP, 22 East 40th Street, New York 16, New York. When inquiring specify CP 5246 opposite last page.

Squeeze refrigeration costs with closer temperature approaches

Obtain 5°F. or closer with Trane Brazed Aluminum Heat Exchangers

Now, even when *large* heat transfer duties are involved, you can obtain temperature approaches of 5 degrees F. or closer! That means *less* refrigeration is required to bring a specified liquid or gas to desired temperature. Operating costs go *down!* You squeeze *more* out of every heat exchange dollar.

What's more, TRANE Brazed Aluminum heat transfer surface makes it *practical!*

TRANE Brazed Aluminum Heat Exchangers can pack up to 450 square feet of heat transfer surface into a single cubic foot. In fact, TRANE Brazed Aluminum Exchangers can occupy as little as *one-third* the space, can weigh as little as *one-fourth* as much as conventional exchangers . . . *and can cost less!*

Yet for all their lightness, compactness and low cost, TRANE Brazed Aluminum units withstand test pressures up to 1,000 psi. Installation costs are lower, too . . . maintenance greatly simplified.

Lower costs plus the ability to perform efficiently and economically at temperatures as low as –350 degrees F. explain why TRANE Brazed Aluminum Exchangers of the type shown at right are used by so many firms for oxygen and ammonia processing and similar uses.

If you have a heat transfer problem involving *close temperature* approaches, *multi-stream exchange* or *low temperatures*, it's time to call TRANE.

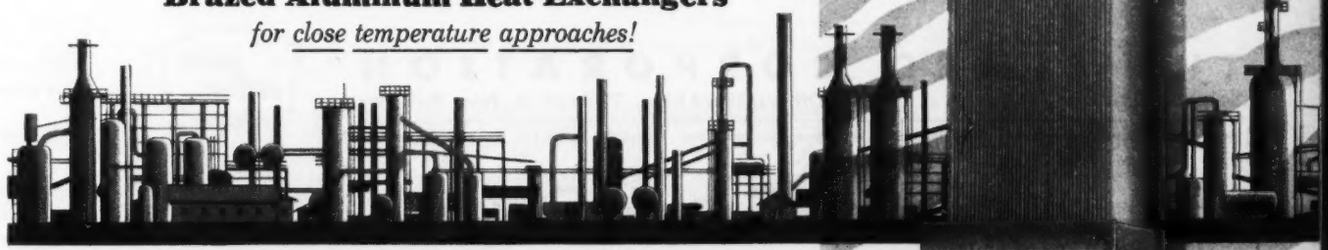
Our 30 years' experience in heat transfer is at your disposal. Just contact your nearest TRANE Sales Office or write on company letterhead to TRANE, La Crosse, Wis.

Specify

TRANE

Brazed Aluminum Heat Exchangers

for close temperature approaches!

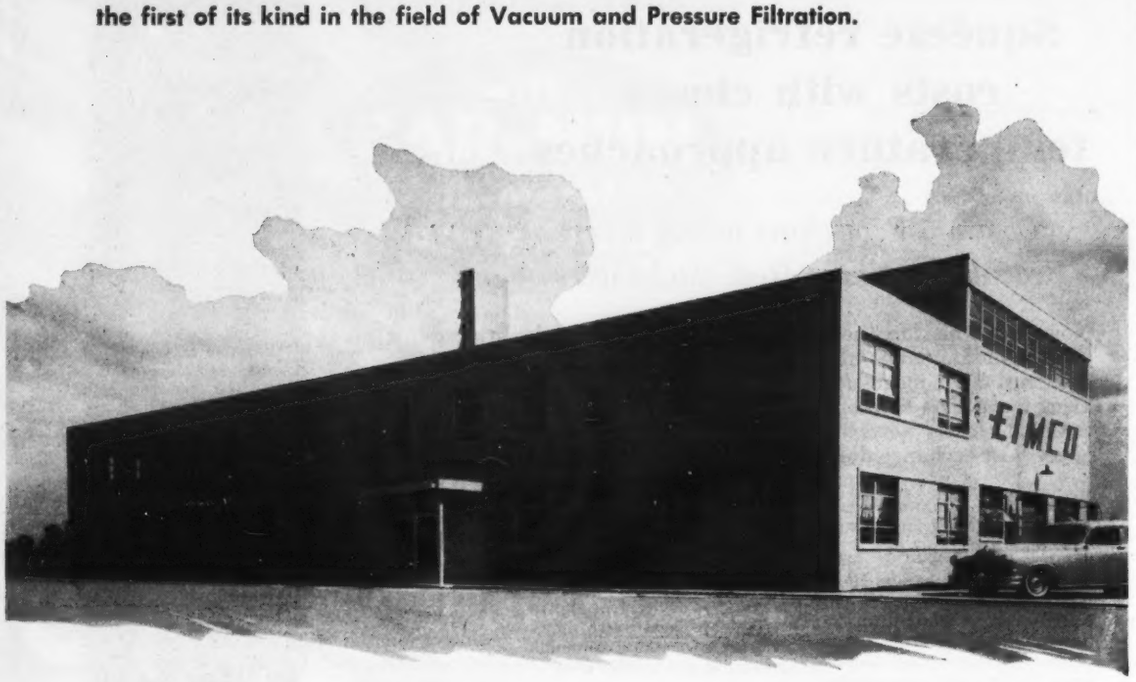


MANUFACTURING ENGINEERS OF AIR CONDITIONING, HEATING, VENTILATING AND HEAT TRANSFER EQUIPMENT

The Trane Company, La Crosse, Wis. • Eastern Mfg. Div., Scranton, Pa.
Trane Co. of Canada, Ltd., Toronto • 90 U.S. and 15 Canadian Offices.

A RESEARCH AND DEVELOPMENT CENTER

the first of its kind in the field of Vacuum and Pressure Filtration.



This is a view of our new Research and Development Center for the benefit of industries concerned with liquid-solids separation through vacuum or pressure filtration.

The new building will also house the Central Division headquarters for sales and service on all Eimco equipment.

Complete pilot plant facilities are available at the Center for development of new processes and new equipment to make the process developed workable and efficient.

Capable engineering and research personnel staff the Center. These men have many years of research experience and more than half a century of Eimco's experience in service to the industries interested in and requiring this type of research.

Located at 301 South Hicks Road at Palatine, Illinois, a Chicago suburb, the Center is easily accessible by train, bus or automobile (only a few minutes from the "Loop.")

You are urged to visit these new facilities and use them in any way to make your work easier in solving problems of liquid-solids separation through filtration.

THE EIMCO CORPORATION

Salt Lake City, Utah—U.S.A. • Export Offices: Eimco Bldg., 52 South St., New York City

New York, N. Y. Chicago, Ill. San Francisco, Calif. El Paso, Texas Birmingham, Ala. Duluth, Minn. Kellogg, Ida. London, Eng. Paris, France, Milan, Italy

B-71

You Can't Beat An Eimco!

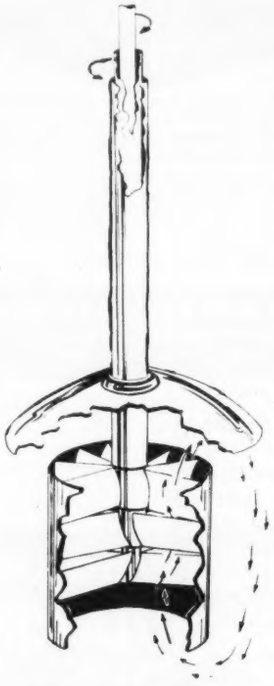
When inquiring check CP 5247 opposite last page

Double shearing action produced by mixer's double impeller, stator design . . .

mixes, disperses paints, inks, chemicals, plastics; doesn't clog, is easy to clean

Uses: For mixing paints, chemicals, inks, plastics, and other materials.

Features: Mixer consists of two impellers and a stator spaced closely together. Impellers turn in opposite directions and create pumping action which moves material being mixed from bottom upward through veins of stator. Double shearing action breaks up and disperses particles.



Cutaway view shows design of mixing head and action produced

Description: Portable mixers are available with motors ranging from 1½ to 5 hp. Parts subject to immersion are made of corrosion-resistant metals. Internally lubricated bearings are used throughout.

Unlike conventional mixers, mixing action takes place under surface and minimum amount of oxygen is induced into mixture. Units are easy to clean, create no vortex, and do not clog.

(Shear-flow mixers are product of Gabb Special Products, Division of The E. Horton and Son Company, Dept. CP, Windsor Locks, Connecticut . . . or check CP 5248 opposite last page.)

Lists more than 30 applications for plate heat exchangers

Design, construction, and operating features of plate heat exchangers are covered in eight-page bulletin. Photographs show various models available and drawings illustrate operation.

"Plate Heat Exchangers for Industry" is issued by The De Laval Separator Company, Dept. CP, Poughkeepsie, N. Y. When inquiring specify CP 5249 opposite last page.

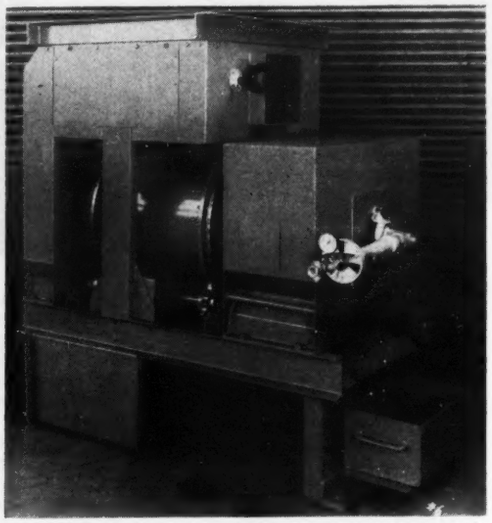
All-positive drive on drum dryer prevents slip at high or low speed or capacity . . .

adjustable feed, speed selection permit suiting operation to specific raw material

Uses: Drying or heating granular crystalline materials.

Features: Positive pin-sprocket transmission to rotating drum and pin-to-pin cam transmission to turnable feeder disc prevent slippage at high or low speed or capacity. Dryer may be used as production or pilot plant unit.

Description: Machine may be operated on either Bunker oil or gas. Location of surge-feed hopper above drum permits hot gases from fuel combustion inside drum to flow against incoming material in



Dryer may be used as production or pilot plant unit, operates on either Bunker oil or gas

surge hopper, thus increasing preheating efficiency of the unit.

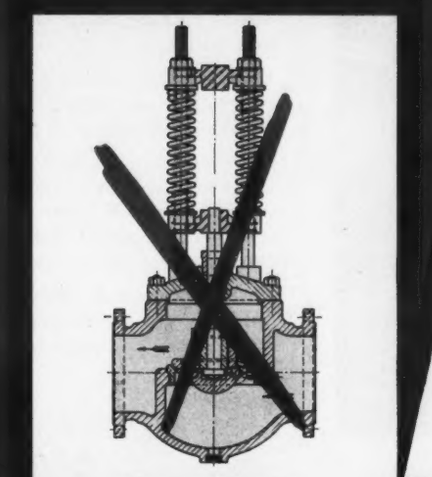
Variable-speed drive permits manual selection of 8 to 24-rpm drum rotation. Both feeder disc for release of measured feed quantity and rotating drum are powered by one ¾-hp variable-speed motor. Dryer is factory-assembled and supplied complete except for main breaker and wiring material. Unit occupies 3 x 5½′ floor area and is 6′ high.

Actual installations as sand dryer have produced capacities of 3 tons an hour.

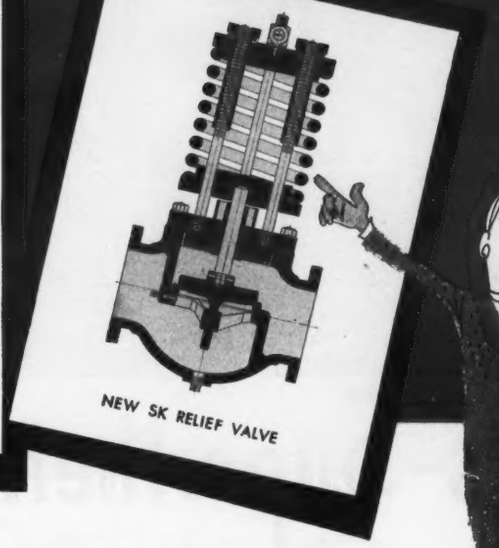
(Dryer is product of Roberts & Schaefer Company, Dept. CP, 130 North Wells Street, Chicago 6, Ill. . . . or for more information about this product reader may simply check CP 5250 on the convenient Reader Service slip which is located opposite last page.)

NOTICE ANYTHING UNUSUAL ABOUT THIS RELIEF VALVE?

ITS NEW FEATURES ARE TYPICAL EXAMPLES OF SK ADVANCED DESIGN



Conventional Relief Valve



NEW SK RELIEF VALVE

Look again . . . at the diagram of the conventional relief valve and the new SK Relief Valve beside it. Note the uncommon features of the SK Valve . . .

. . . Single Spring Construction. This eliminates the cumbersome, unstable superstructure of conventional, multiple-spring relief valves.

. . . Large Coil Diameter and Heavy Spring Wire Cross Section. This provides maximum spring stability; there is the least possible difference between pressure needed to unseat the valve and that required to force it full open.

. . . Valve-Spindle Guides Both Above and Below Valve Disc. These assure accurate seating and permit the use of valve in any position and its installation in vertical or horizontal pipelines.

. . . Reduced Over-all Height Through the Use of Reach Nuts. This eliminates long spring rods and permits the use of rods which do not extend beyond the upper spring plate after compression.

BUT THIS IS NOT ALL!

Right now—while you read this—new products and improvements are taking form on our drafting boards, and others are being third-degree'd in our research and testing laboratories. We call this "Progressive Design" —a job at which we excel because we have the staff, the background, the ability and the facilities to deal with the toughest problems. We invite you to prove this. If a design puzzle has you frustrated, bring it to us. No obligation, of course.

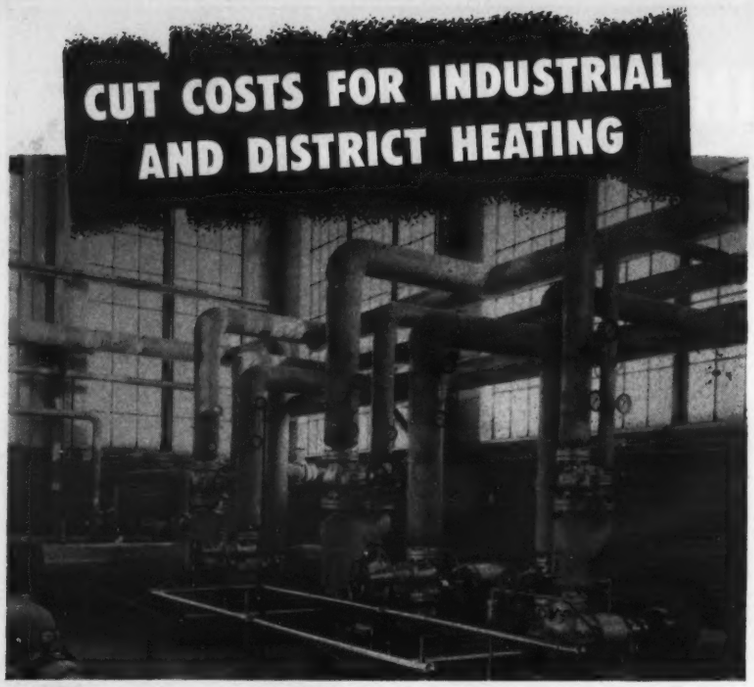
SEND FOR YOUR FREE COPY OF NEW VALVE BULLETIN V-1

It describes, in condensed form, the line of valves made by SK. You'll find it a gold mine of information.

Schutte and Koerting COMPANY
MANUFACTURING ENGINEERS
2215 STATE ROAD, CORNWELLS HEIGHTS, BUCKS COUNTY, PA.

Jet Apparatus • Heat Transfer Equipment
Strainers • Condensers and Vacuum Pumps
Oil Burning Equipment • Rotameters
Flow Indicators • Radiafin Tubes • Valves
Spray Nozzles and Atomizers • Gear Pumps
Desuperheaters

When inquiring check CP 5251 opposite last page



Ross-Supertherm

High Pressure Hot Water Heating

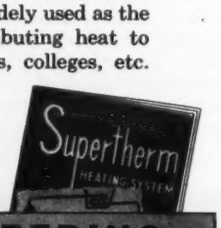
Registered CALDON U. S. Pat. Off.

The simplicity and economy of the ROSS Supertherm High Pressure Hot Water System is now recognized throughout industry. By replacing the use of costly steam with High Pressure Hot Water for other than power, leading manufacturers are effecting fuel savings ranging from 15% to 30% and more along with substantially lower operating and maintenance costs. Furthermore they are bettering the quality of their finished product by a more uniform temperature control.

High Pressure Hot Water Heating is in successful use in all industries for space and process heating. It is widely used as the heat carrier in district heating and for distributing heat to scattered buildings such as airfields, hospitals, colleges, etc.

Write For This Bulletin....

Completely describes the system, its features and applications, charts, heat loss comparisons, etc. Ask for Bulletin 300 C.



ROSS SYSTEMS

J. O. ROSS ENGINEERING CORPORATION

MANUFACTURERS OF AIR PROCESSING SYSTEMS

444 MADISON AVENUE NEW YORK 22, N. Y.

ATLANTA • BOSTON • DETROIT • CHICAGO • SEATTLE • LOS ANGELES

ROSS ENGINEERING OF CANADA, LIMITED, MONTREAL, CANADA • CARRIER-ROSS ENGINEERING COMPANY, LIMITED, LONDON, ENGLAND

When inquiring check CP 5252 opposite last page

Pharmaceutical cartridges washed, dried, assembled by single machine . . .

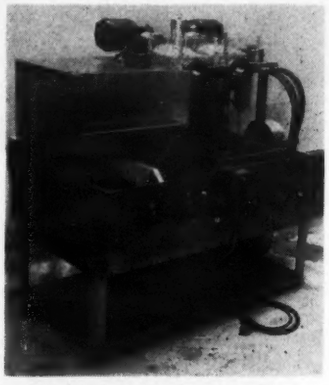
finished containers ready for sterilizing

Uses: Assembling pharmaceutical cartridges.

Features: Combination unit performs operations formerly done by individual machines.

Description: Machine can handle 120 penicillin or dental-type cartridges per minute. Finished containers are pushed into accumulator, ready to be sterilized.

Machine operates as follows. Glass cartridges are fed from hopper into detergent and positioned for brushing operation. Brushes automatically enter cartridge twice and glass moves to rinse position where it is flushed by jets of clear water.

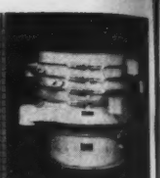


Combination machine performs operations formerly done by separate machine

Air blow removes excess water. Moving under plunger chutes, cartridges are lubricated with glycerine and automatically fitted with plungers. Hollow needles enter end opposite plunger and water jets flush out excess glycerine and any foreign matter. Tubes are dried by jets of filtered air and enter accumulator.

(Cartridge machine is product of Ampoule Machine Company, Dept. CP, 38-09 24th Street, Long Island City 1, N. Y. . . . or for more information check CP 5253 on handy form opposite last page.)

SCREENING NEWS



Helpful information on screening and separating operations . . . from field reports of **SWECO SEPARATOR** *District Engineers*

No screen wear after 4½ years sizing corrosive iodide crystals

Nearly five years ago the Deepwater Chemical Company of Compton, California, asked SWECO to improve the quality sizing of potassium iodide crystals. Accurate sizing of crystals to fit different market requirements has been a problem with conventional equipment.

The Company processes its potassium iodide from brine pumped out of the nearby oil fields. A metallic salt is added to precipitate out the iodine as an insoluble salt, which is scalped out as a paste. The paste is roasted to remove inorganic impurities and washed to remove soluble salt residues. The iodide salt is then tumbled with nails to form ferrous iodide to which potassium carbonate is added, and the resultant potassium iodide solution is passed through an evaporator to the crystallizing tanks. Large salt crystals form in these tanks from which they are centrifuged and then pan dried for 16 hours. Pure white potassium iodide is then ground and passed through a 16-mesh screen cloth. At this point the sizing of crystals is of vital importance in marketing.

The product is fed to a single deck 18" dia. SWECO Vibrating Screen Separator using interchangeable 20 mesh and 40 mesh screens. The plus-20 mesh product is supplied to the chemical industry; plus-40 mesh material goes to pharmaceutical manufacturers; and minus-40 mesh material goes to producers of stock food mineral supplements.

The Deepwater Chemical Company reports that their SWECO has been in almost continuous operation for nearly five years—without maintenance cost. Despite the highly corrosive nature of potassium iodide, the original screens are still in use and show no screen cloth wear.

Free screening analysis and recommendations . . .

SWECO District Engineers are available to make detailed analyses and recommendations on specialized screening operations without cost to you.

SEND FOR BULLETIN No. 46-3

Detailed information on applications of SWECO Screen Separators.

SWECO SEPARATORS

SOUTHWESTERN ENGINEERING COMPANY

4800 Santa Fe Ave., Los Angeles 58

LOgan 8-6262—Cable: SWECOLA

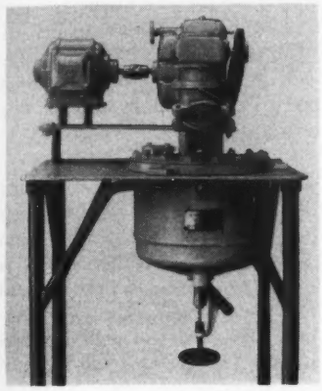
Engineers and Constructors . . . Manufacturers

When inquiring check CP 5254 opposite last page

Offered in one package — 5-60 gal pilot plants

Uses: For pilot plant reactions and distillations.

Features: Reaction-distillation units are supplied in packaged form — complete with reactor, condenser, receiver, decanter, piping, valves, and instruments.



Description: Plants are available in capacities ranging from 5 to 60 gallons. Individual reactors, designed for flexibility and convenience, are also offered. All units are field-tested.

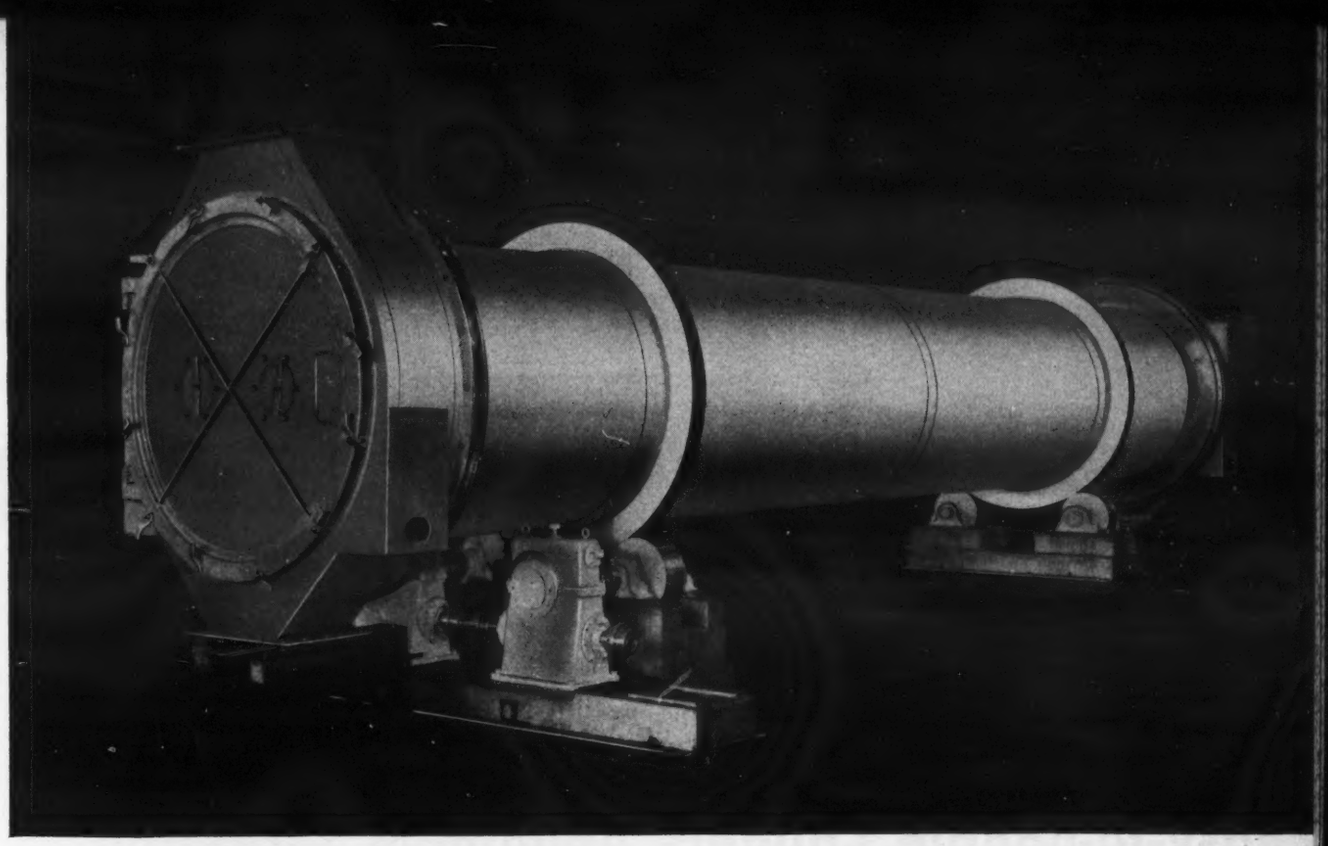
(Packaged pilot plants are product of Patterson-Kelley Company, Inc., Dept. CP, East Stroudsburg, Pa. . . . or for more information check CP 5255 opposite last page.)

Tells theory, applications of mulling operation

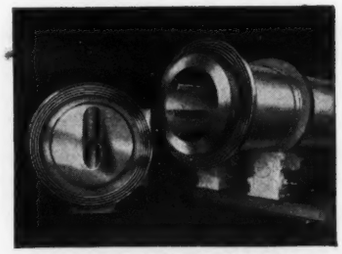
Complete with photographs, drawings, and tables, 12-page bulletin describes principles and application of mulling.

Bul 522 is issued by Simpson Mix-Muller Division, National Engineering Company, Dept. CP, 640 Machinery Hall, Chicago 6, Illinois. When inquiring specify CP 5256 opposite last page.

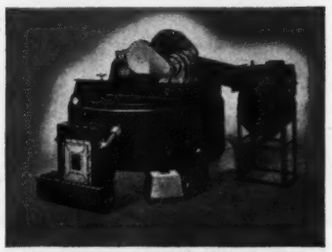
For more information on product at right, specify CP 5257 . . . see information request blank opposite last page.



stainless steel Plastics Dryer



Labyrinth Seal on 60" x 32' 0" Stainless Steel Plastics Dryer showing the Mirror-like Finish on the Shell and Flights.



Special Steam Jacketed Batch Dryer showing Dustless Discharge to Screw Conveyor and Condenser where Fines are Reclaimed from Vapors.

60" x 32'0" stainless steel dryer with all interior surfaces polished to mirror finish prevents color contamination—and spoilage—between different batches of a well known plastic.

● This is probably one of the most costly direct heat rotary dryers ever built. Even the feed and discharge breechings and inspection doors are of stainless steel. Inlet air used for drying is filtered. Discharge air is passed through a stainless steel cyclone dust collector. Fabricated in our shops, this unit typifies Bartlett-Snow's ability to design and build equipment for even the most exacting operating and service requirements.

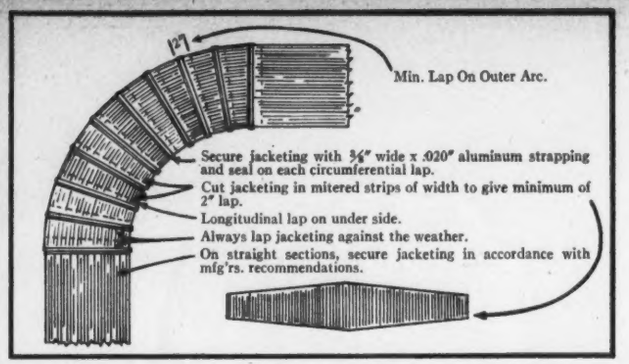
DESIGNERS ENGINEERS

BARTLETT-SNOW CLEVELAND 5, OHIO

FABRICATORS ERECTORS

Dryers • Coolers • Calciners • Kilns

"Builders of Equipment for People You Know"

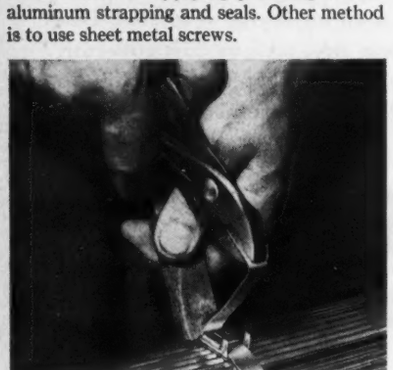

Min. Lap On Outer Arc.
Secure jacketing with ¾" wide x .020" aluminum strapping and seal on each circumferential lap.
Cut jacketing in mitered strips of width to give minimum of 2" lap.
Longitudinal lap on under side.
Always lap jacketing against the weather.
On straight sections, secure jacketing in accordance with mfg'rs. recommendations.

New method of applying aluminum jacketing over pipe bends with a radius of 5 diameters or more is shown above.

Cutaway view shows how jacketing goes on right over the insulation. Tests show Childers is the lowest cost of any permanent metal jacketing that is available today.

Only pliers and pocket knife needed to apply easy-to-handle Childers Aluminum Jacketing

Best method of applying jacketing is with aluminum strapping and seals. Other method is to use sheet metal screws.



Aluminum strapping can be pulled tight enough with just pliers. Lugs are then bent over and fastening is complete.

Eastern States Petroleum's two-man crew covers insulated lines, even L's and bends—using light-weight, weatherproof aluminum jacket.

Childers Jacketing for insulated lines, made of .006" 3S alloy aluminum, was used to cover thousands of feet of line in Eastern States Petroleum's Houston plant.

As it does in over 1000 other plants in all 48 states and many foreign countries, Childers Jacketing helped save Eastern States many expensive hours of application and maintenance time.

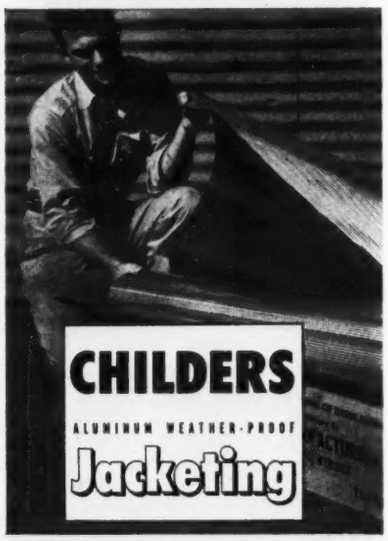
In fact, tests show this: Two men, working with Childers Jacketing for the first time, can cover more feet of insulated line in a day than with practically any other kind of covering. This means real savings in application costs.

The cost is low, too. You can actually put aluminum jacketing on your lines for less than the cost of the cheapest weatherproofing when one paint job is considered.

Immediate shipment from our large factory stocks can eliminate costly delays in construction or plant improvement schedules.

Try this low cost protection in your plant. Write today for engineering data and information about how you can order a 400 sq. ft. roll to test on one of your insulated lines. No obligation. Address: Childers Manufacturing Company, Department LP-10, 3620 West 11th Street, Houston, Texas.

Engineering representatives in most cities to work with you on jacketing problems.



Childers Jacketing arrives on the job in convenient rolls 4 feet wide and 100 feet long—easy for one man to handle. Jacketing comes with or without a moisture barrier attached to the back of the .006" aluminum. Rolls are well protected for field storage if kept dry. Boxes light enough for one man to carry. **(Adv.)**

PROCESSING

Redesigned clarifier cuts recausticizing system costs . . .

former units replaced by single-compartment machine

Based on research program and field tests, manufacturer has substituted single-compartment clarifier (equipped with feedwell) for the four-compartment machines previously used in green-liquor section of continuous recausticizing system. Investment and operating costs are reduced by design, and overflow clarity is comparable to that of tray units.

Redesigned clarifier has ten-foot sidewall depth and 12 to 16-foot center depth, depending upon diameter of unit, unless deeper tank is required to obtain hydrostatic head for gravity flow. Unit compartment design is also used in dregs washer, although tank and feedwell are more shallow than in green-liquor clarifier.

Dregs and wash water are premixed externally in small tank having 30-minute detention time. Pumping of dregs from green-liquor clarifier is controlled by time clock which actuates pump every 15 minutes.

(Recausticizing system is development of Dorr-Oliver, Inc., Dept. CP, Barry Place, Stamford, Conn. Check CP 5258 opp. last page.)

Explains principles of rapper

Device for automatic and continuous cleaning of collection electrodes in Cottrell electrostatic precipitator is described in six-page bulletin.

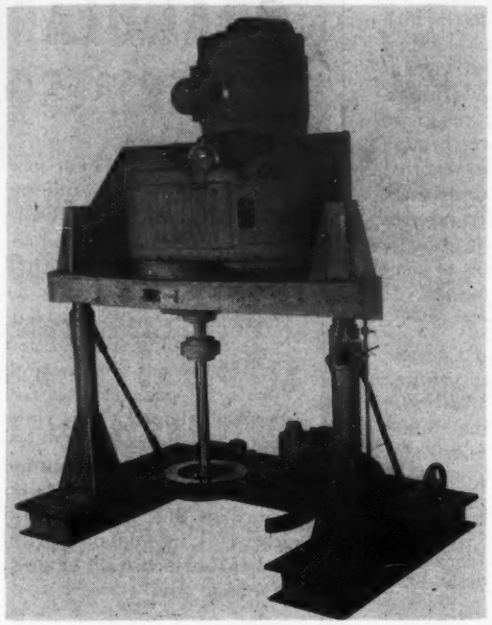
Bulletin on automatic rapper is issued by Research-Cottrell, Inc., Dept. CP, 405 Lexington Avenue, New York 17, New York. Specify CP 5259 opp. last page.

For more information on product at left, specify CP 5260 . . . see information request blank opposite last page.

Mixer goes up, down electrically, results in quick changing of cans

Uses: For rapid mixing and dispersion of inks, paints, chemicals, and other materials.

Features: Mixer handles materials with viscosities up to 40,000 cp. Variable-speed unit operates from 320 to 640 rpm. Entire mixing mechanism is raised



Unit has 15"-diameter shrouded-turbine mixing head

or lowered electrically by gearhead motor for quick changing of cans.

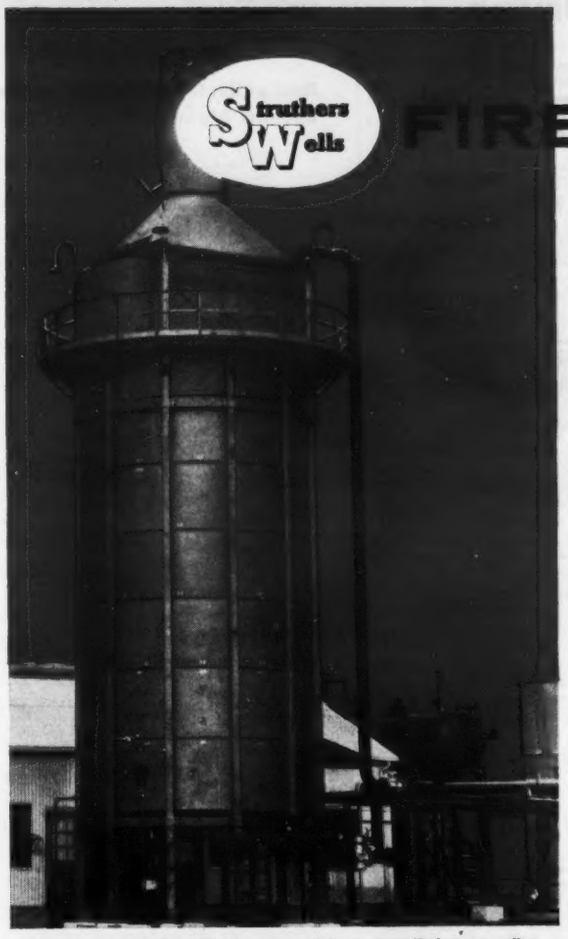
Description: Mixers are available in 5 to 15-hp sizes and can handle tubs or cans up to 42" in diameter. Unit has 15"-diameter shrouded-turbine mixing head.

Machine is equipped with tub clamps, which are operated by small handwheel near base of unit. Clamps are lined with brake lining to facilitate gripping power.

(Change can mixer is product of The Stevenson Company, Dept. CP, 228 N. Wilkinson St., Dayton, Ohio. Check CP 5261 opposite last page.)

For a guide to processing ideas . . .

You'll find what you need in the handy Product Directory on pages 217 to 220. All products and processes are listed there.



A Struthers Wells Type CV absorption oil heater installed at a gasoline plant of one of the largest gas transmission companies, the third installation for this company.

FIRED HEATERS

FOR

PETROLEUM REFINING

GASOLINE PLANTS

CHEMICAL PLANTS

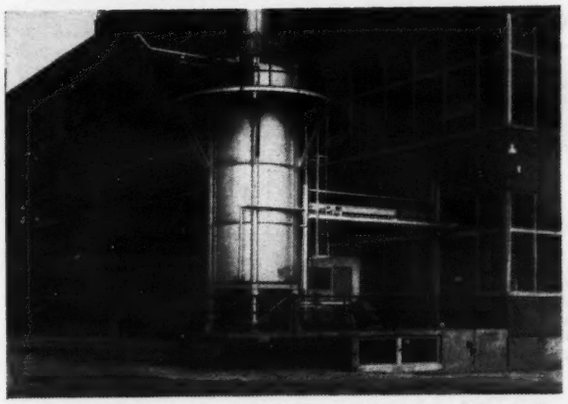
GENERAL INDUSTRIAL USE

Available in standard sizes from 500,000 to 40,000,000 BTU per hour

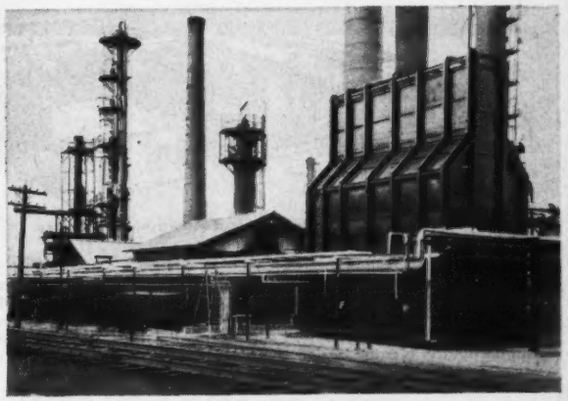
Hundreds of Struthers Wells fired heaters are now in service, in a wide range of sizes, for direct heating of petroleum oil, hydrocarbon gases, asphalt, air, oxygen, hydrogen and superheating steam, and for indirect heating using circulating heat transfer mediums. Circulating fluids used include molten metal, molten salt, Dowtherm, mineral oil, and a number of other organic materials.

In connection with heating systems, we can supply all equipment items, as a complete unit, including wired and piped panel control boards.

We also supply electrically heated units—and special heating and cooling equipment, including water heaters.



A fired heater for Struthers Wells Dowtherm heating system, one of two units installed in a new chemical plant for the production of vat dyes.



Shown above are two Struthers Wells heaters in petroleum refinery service. At right is a three-coil heater used in catalytic reforming of gasoline. At left is a heater which was installed over 23 years ago, and is still in continuous service.

STRUTHERS WELLS CORPORATION

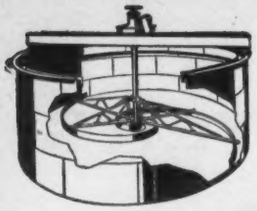
WARREN, PA.

PLANTS AT WARREN, PA. AND TITUSVILLE, PA.

Offices in Principal Cities

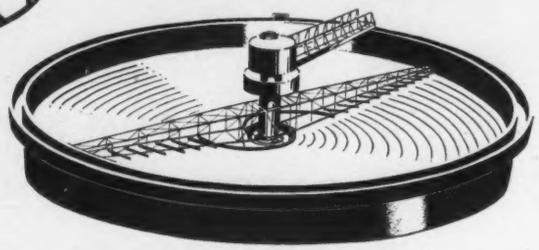
Struthers Wells

When inquiring check CP 5262 opposite last page



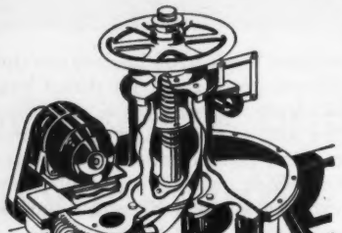
Small beam-supported thickener

HARDINGE EQUIPMENT for WATER TREATMENT, LIQUID WASTE DISPOSAL, BY-PRODUCT RECOVERY

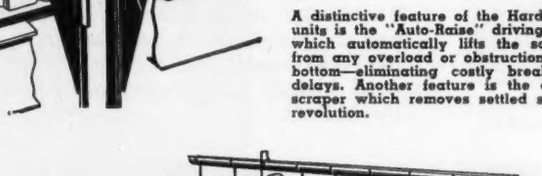


Large center-column type clarifier

Hardinge Thickeners and Clarifiers have solved water treatment, waste-water disposal, or by-product recovery problems in coal plants, oil, glass, lime, stone, sand, carbon black, meat packing, rubber, domestic sewage plants and others. One reason for the efficiency of Hardinge units is the fact that the influent goes directly to a central stilling well and the underflow also is centrally removed. This promotes quick disposal of the heavier solids immediately upon entry—makes less work for the rotating sludge scrapers. The clear effluent overflows the tank periphery, where velocity is at a minimum. Available for steel, tile, wooden or concrete tanks up to 200' diameter. Write for Bulletin 35-D-13.



A distinctive feature of the Hardinge settling units is the "Auto-Raise" driving mechanism, which automatically lifts the scraper away from any overload or obstruction in the tank bottom—eliminating costly breakdowns and delays. Another feature is the double-spiral scraper which removes settled solids in one revolution.



Automatic Backwash Sand Filter

Another liquid processing device offered by Hardinge is a sand filter which cleans itself—automatically—with no interruption whatever to the filtering operation. No shutdown or change-over is necessary while cleaning is in progress. The secret lies in its special, compartmented filter bed and traveling backwash mechanism which automatically cleans one compartment at a time. May be used for plant supply water or for waste water treating. Write for Bulletin 46-A-13.

HARDINGE
COMPANY, INCORPORATED

YORK, PENNSYLVANIA • 240 Arch St. • Main Office and Works

New York • Toronto • Chicago • Hibbing • Houston • Salt Lake City • San Francisco

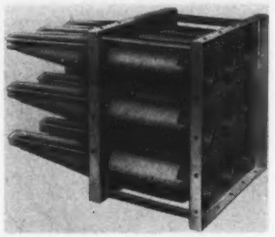
When inquiring check CP 5263 opposite last page

Dust collector takes less space, but has higher efficiency . . .

tubes have two to three times the rated capacity of conventional units

Uses: Removing or recovering granular dusts, fly ash, and similar material from exhaust gases.

Features: "Reverse tangent" principal of operation permits clean air to travel through tubes without changing direction, and results in high collection efficiency over wide range of exhaust volumes. Collector requires less space because tubes are reported to have two to three times rated capacity of those in conventional units of comparable rating.



Cells have nine 4"-diameter tubes, each with face area of 20 x 20"

Description: Collector for dry, granular dusts consists of a number of modular cells combined to achieve the required capacity. Each cell is composed of nine 4″-diameter tubes. Tubes are made of thick-wall gray iron castings and have an approach velocity of 1000 fpm and a cleaning velocity of 333 fpm. Individual cells have face area measuring 20 x 20″, with nominal rating of 3000 cfm.

Tangential air inlets on tubes cause swirling motion (giving air an outside-in twist) which throws dust particles to outer perimeter of tubes. Clean air travels

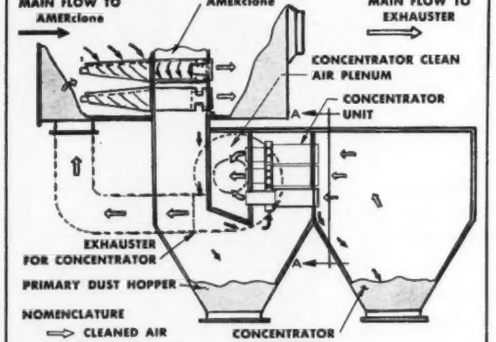


Diagram illustrates dust collector's operation

out through other end of tube. Collected dust and about 10 per cent of the primary air circuit is bled off and thrown into primary dust hopper.

Any unsettled dust existing in primary hopper is drawn into a secondary air circuit where concentrator tubes make final separation. Air enters tubes tangen-

DO YOU REQUIRE ACCURATE SIZING OF GRANULAR MATERIALS?

If you process granular materials that must be uniform in length, width, or thickness, Hart-Carter sizing machinery may be what you need.

Hart-Carter makes several types of equipment that accurately sizes or separates by means of pocketed Carter discs or indented Hart cylinders . . . or by cylinders perforated with either slots or recessed round holes. These principles and methods are described in folders CPG-2 and L-1, which we'll be glad to send to you.

Information you supply our technicians about the in-put materials to be sized, and the "product" specifications, will enable them to make sound recommendations. (Such information will be kept confidential, of course.) Tests in the Hart-Carter Laboratory are free.

Write today for folders CPG-2 and L-1

HART-CARTER
COMPANY

677 19th Avenue N. E.
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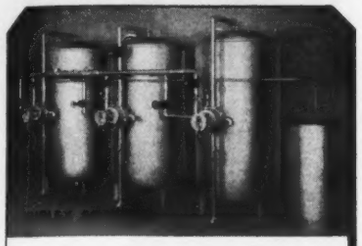
Since 1919 . . .
Engineers and Manufacturers of Machinery for Separating and Sizing Granular Materials

When inquiring check CP 5264 opposite last page

ILLCO-WAY
ionXchange



HOW TO GET GOOD
SOFT WATER
OFTEN CALLS FOR
EXPERIENCED
ENGINEERING

With the advent of modern ion-exchange resins about 20 years ago, the familiar problem of softening "hard" water has found a number of new and interesting solutions. For one thing, the new resins have many times the capacity of the old greensands and zeolites. (Simply putting one of the new ILLCO-WAY Resins in your *old* softener may show a surprising saving.) For another thing, up-to-date knowledge of the available resins, and how best to use them, can lead to some interesting improvements in the degree and manner of softening, and may also provide valuable collateral achievements in the same process. Satisfying results are best obtained from EXPERIENCE such as we have gained as pioneers and specialists in the field. We have been making successful applications of modern ion-exchange methods ever since the year the new resins were introduced. *Please tell us your wishes, and let us offer a suggestion.*

ILLINOIS WATER TREATMENT CO.
ionXchange
ILLCO-WAY
903 CEDAR ST.
ROCKFORD,
ILLINOIS
NEW YORK OFFICE: 141 E. 44TH ST., NEW YORK 17, N. Y.
CANADIAN DIST. PUMPS & SOFTENERS, LTD. LONDON, ONT.

When inquiring check CP 5265 opposite last page

tially and then changes direction 180°, causing dust to be thrown out at one end and air out opposite end.

Each cell requires two concentrator tubes. Collected dust is deposited in concentrator hopper and the cleaned air is blown back into the inlet plenum. Collector has pressure drop (at normal rating) of 4½" at standard 70°F, 29.92" barometric pressure air, and maximum operating temperature of 750°F.

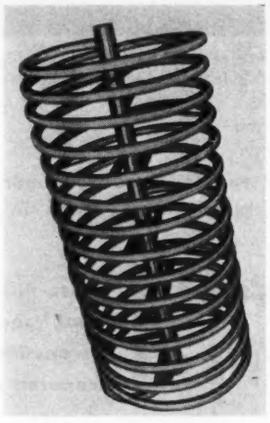
(Amerclone dust collectors are product of American Air Filter Company, Inc., Dept. CP, 258 Central Avenue, Louisville 8, Kentucky . . . or for more information reader may simply check CP 5266 on convenient Reader Service slip which is located opposite last page.)

Simultaneous heating, mixing provided with rotating coil, shaft . . .

hollow assembly is heated by steam and rotated by reducing gear arrangement

Uses: For simultaneous heating and mixing of chemicals, foods, and similar products.

Features: Stainless steel shaft and coil are integral assembly. Steam is fed into shaft through socket-type fitting, passes through coil, and leaves at opposite end of shaft. Complete assembly is rotated by reducing gear arrangement attached to electric motor.



Rotating-coil heater is well-suited for mixing chemicals, foods, and similar products

Description: Coil is 36" in diameter and consists of about 15 turns. It is constructed of 2" OD x 16 GA type 304 stainless tubing. Ends are welded to hollow ends of shaft, so that steam circulates through entire assembly.

Shaft is 80" long and has 4" OD. It is not hollow full length — only at the ends. Shaft is mounted on end bearings. Flat spokes support position of coil and also act as agitator paddles when assembly rotates.

(Rotating-coil heater is product of Rempe Company, Dept. CP, 340 N. Sacramento Blvd., Chicago 12, Illinois . . . or for more information about this product reader may simply check CP 5267 on convenient Reader Service slip which is located opposite last page.)

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Call on
PROCTOR & SCHWARTZ

to gain advantages of an organization with largest aggregate of

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in application of drying equipment in the chemical industry

PROCTOR equipment is at work in all branches of the process industries: heavy chemicals, pharmaceuticals, plastics, foods, leather, synthetic textiles, rubber manufacturing, glue and gelatin, and many other related industries.

PHONE MICHIGAN 4-6400 OR WRITE

PROCTOR & SCHWARTZ INC.
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When inquiring check CP 5268 opposite last page

CUT COSTS
Pack Chemicals in VALVE BAGS with

AUGER-MATIC

Fills and Weighs... All in *One* Operation

NO DUST

Cut production costs by packing your product in modern self-closing bags... the AUGER-MATIC Bag Packer fills them quickly to any weight desired... shuts off automatically.

NO WEIGHING

Valve Bags fit snugly on AUGER-MATIC spout so no dust escapes . . . keeps bags clean . . . eliminates costly tieing or bag closing equipment.

NO SEWING . . . NO TIEING

AUGER-MATIC Bag Packer is equipped with multi-twist auger . . . packs any materials from powder to pellets. Easily moved from one filling point to another.

Send for descriptive literature

E. D. CODDINGTON MFG. CO.
5036 North 37th Street • Milwaukee 9, Wisconsin

When inquiring check CP 5269 opposite last page

After squeeze bottles are filled through large base opening at high speed, rotary heat sealing unit (arrow) welds bottom discs to walls of container

Extrusion-fabrication process enables broad commercial production of polyethylene tube which results in —

lower cost squeeze bottles

Base-filling of both collapsible tubes and "squeeze-to-use" bottles is possible, permitting reduced packaging time

First broad commercial production of polyethylene tube in this country — aimed at supplying containers for those powders, liquids, and semi-liquids packageable in polyethylene — has been made possible by an extrusion-fabrication process invented in Europe. This manufacturing process lowers the cost of the popular "squeeze-to-use" bottles and "controlled-dispensing" collapsible tubes.

One big advantage offered by these containers is that they can be filled through the large base opening, as compared with neck filling necessary for blow-molded bottles. This increases filling speed with resultant lower packaging costs and increased output. Bottoms of bottles are sealed with polyethylene discs which are fused by radiant heat and welded to walls. Bottoms of collapsible tubes are also fused under radiant heat and then crimped together tightly by cooled jaws.

Polyethylene is, of course, inert to most chemicals, so that tubes and bottles are corrosion-proof, eliminating the need for internal waxes or lacquers. In addition, the containers are lightweight, strong, and resilient, holding their shape and re-

Collapsible "controlled-dispensing" tube (here containing waterless hand cleaner) is lightweight and resilient. It holds its shape and recovers from blows received in filling, handling, shipping

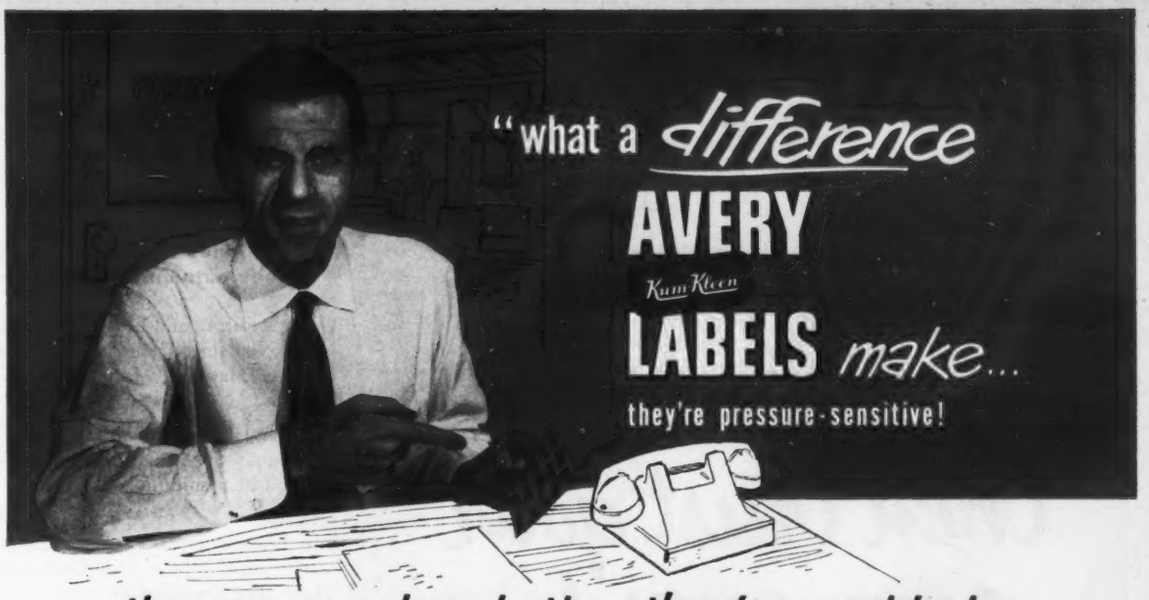
covering from blows received in filling, handling, and shipping. They can be attractively printed to give merchandizing appeal.

Manufacturer of these polyethylene tubes also offers a "cold" sterilization process accomplished by electron beam. Sterilization is done at room temperatures so that plastic tubes and bottles will not melt or become deformed. Where packages are very small, both container and contents can be sterilized at once.

Tubes and bottles, marketed under the trade name Bracon, are available in three wall thicknesses, in a range of sizes and diameters. Stock sizes of tubes hold from 1/8 to 16 fluid ounces, with diameters ranging from 3/8 to 2-3/8". Bottle diameters range from 1/2 to 2-3/8", with fluid capacities from 1/4 to 16 ounces. Since containers are bottom-filled, heads can be made with restricted openings from pinpoint to full size, allowing a wide range of dispensing action. When plugs or spray-tubing are required for nasal sprays or other aspirator packages, they are assembled and inserted by tube manufacturer.

Although suitable for packaging a wide range of products, these polyethylene containers at present are limited by these factors: 1) oxygen is transmitted by package walls, making difficult the packaging of those animal and vegetable oils which turn rancid when exposed to air; 2) certain complex organic flavorings and essences may permeate package; 3) some, but not all, organic solvents can escape through the package walls. In view of these factors, tube manufacturer maintains a laboratory for testing materials that are to be packaged in Bracon containers.

(Polyethylene containers are products of Bradley Container Corp., Dept. CP, Maynard, Mass. . . . or check CP 5270 opposite last page.)



they sure speed production...there's no moistening —no waste motion!"

Consider these practical labeling advantages!

■ *All waste motions are eliminated*—for unlike ordinary labels, Avery Pressure-Sensitive Labels are applied dry! An automatic dispenser pops them out—the operator simply *lays* the label in place on the product or package—*without moistening.* That's all there is to it!

■ *Production line speed*—Avery dispensers speed every type of labeling job—whether it's a single item or a thousand. Labels are fed, *one-at-a-time,* ready for instant application. There's no sorting of loose labels...no messy glueing or licking...no soiled, spoiled packages.

■ *They stick, and stay stuck*—Avery Kum-Kleen Labels stick to any clean, smooth surface—*right now*—and will not curl, peel or pop off! That's why Avery Kum-Kleen *Pressure-Sensitive* Labeling is different...it's practical and economical. Write now for details—free sample labels—case histories!

SPECIFICALLY SPEAKING...
how to handle a hard-to-label surface...

Kirkhill, Inc., selected a transparent, Polyethylene bag to give extra sales appeal to their line of faucet repair kits. These kits each contain some 30 different items for repairing almost any conceivable type of swing spout faucet, and this plastic bag made an ideal display and a perfect package.

But how to identify it...how best to show off the Kirkhill brand? Avery *Pressure-Sensitive* Labels, of course! These attractive labels stick instantly to the flexible plastic surface—without drying out or popping off! They stick—and stay stuck...they identify both the product and the manufacturer. Where can *you* use quick, clean Avery Labeling in *your* business?

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117 Liberty Street, New York 6 • 608 S. Dearborn Street, Chicago 5
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☐ Please send case histories and free samples ☐ Have the Avery Label man call

*Name*_____
*Company*_____
*Address*_____
*Our Business Is*_____

When inquiring check CP 5271 opposite last page

Want Proof?

then trust your own eyes!

And you will know that Bemis color printing of brands on multiwall paper bags is bright, crisp, color-true . . . the kind that will boost the selling power of *your* brand.

Ask your Bemis Man to show you typical Bemis multiwall printing. Trust your own eyes.

Bemis

BEMIS BRO. BAG COMPANY

General Offices—St. Louis 2, Mo.
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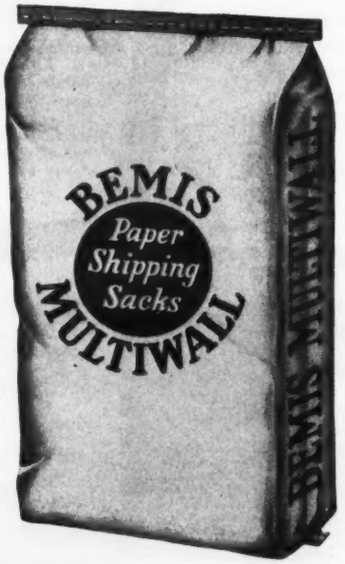


When inquiring check CP 5272 opposite last page

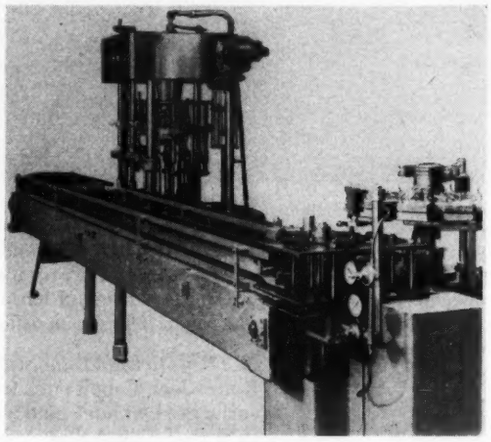
Plastic containers filled and sealed at speeds to 120 a minute

All kinds of liquids can be handled by fully automatic unit

Uses: Filling and heat-sealing closures of Bracon plastic containers (product of Bradley Container Corp. of Maynard, Mass.) with all kinds of liquid products.

Features: Filling unit is fully automatic, and continuous operation allows production speeds of up to 120 a minute.

Description: In operation, containers are fed into holders on a chain-driven conveyor, which carries them into a 12-station, rotary filling unit. There they are filled by gravity, vacuum, or pressure, as desired. Entire filling mechanism is above conveyor, so that floor is kept clear of encumbrances which might interfere with cleaning.



Filling can be by gravity, vacuum, or pressure

After filling, containers are fed into a 12-station, rotary sealing unit, whose speed is synchronized with that of filling unit. There, heat seal is applied, welding base plate to plastic bottle.

All parts of machine which come in contact with filling material are of stainless steel. Equipment is available both for fully automatic or semi-automatic operation, and can be furnished for heat-sealing of collapsible plastic tubes.

(Filling machine is a product of MRM Company, Inc., Dept. CP, 191 Berry St., Brooklyn 11, N. Y. . . . or for more information check CP 5273 on handy form opposite last page.)

(*This is one of several filling machines that has been adapted specifically for handling Bracon containers. See story, page* 162)

behind a QUALITY product—

. . . a QUALIFIED technical service

Depend on *Harrisburg Steel* for quality seamless steel cylinders for high-pressure gases . . . hundreds of companies, large and small, have done that for generations!

And don't forget: when you have a *technical problem* involving cylinders, or need a special type of cylinder, put it up to *Harrisburg Steel's* expert engineering staff.

Address our Sales Engineer . . . or write today for Catalog and prices.

HSC-CC-2/54

101 YEARS IN PENNSYLVANIA'S CAPITAL

Harrisburg Steel CORPORATION

HARRISBURG 24, PENNSYLVANIA

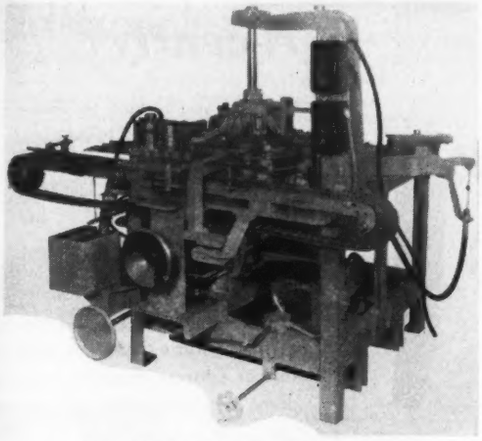
When inquiring check CP 5274 opposite last page

Sustained production of 70/min handled by fully automatic filling machine

Uses: For short run, automatic bottle labeling operations.

Features: Being fully automatic, full rated capacity of unit (70/min) is available for sustained production. No operator attention is required. Vacuum principle of label handling is used and assures perfect register without constant attention to glue station.

Description: Designed for labeling speeds up



No label supplied unless bottle is present

to 70 bottles/min, Pony Express labeler offers advantages of quick changeover, low cost change parts, and precision label placement. Glue handling is accomplished with a self-contained glue pumping system, assuring uniform glue consistency on applying roll at all times. Machine washup is accomplished quickly and with minimum attention by simply circulating water through pumping system. Unit will handle odd shapes of bottles and labels with same facility as standard.

Labels are not glued unless signaled by an oncoming container. Containers are clamped into position prior to moving toward labeling station, to avoid faulty label register.

(Label machine is a product of New Jersey Machine Corp., Dept. CP, 1580 Willow Ave. Hoboken, N. J. . . . or for more information check CP 5275 on handy form opposite last page.)

Solids content of Waste Sulfite Liquor can be found in a jiffy from density. See nomograph on page 206.

You'll grade
"F" style cans
A+
We are pleasing some of the most particular people in the petroleum and chemical industries with our Tailor-Made Package Service. Why not let us do the same for you? We'll give you "F" style cans that are precisely right for your product . . . in the size you want . . . and lithographed to your taste. We'll deliver these cans when and where you say. And we'll make available expert engineering and research help in any quantity you can use. In all our dealings with you, we'll treat you as if you were our only customer.
CONTINENTAL CAN COMPANY
Continental Can Building
100 East 42nd Street, New York 17, N. Y.
Eastern Division: 100 E. 42nd Street, New York 17
Central Division: 135 So. La Salle Street, Chicago 3
Pacific Division: Russ Building, San Francisco 4
TAILOR-MADE PACKAGE SERVICE

When inquiring check CP 5276 opposite last page

HI-BAKE LININGS
for your Hard-to-Hold products

BENNETT
DOUBLE PROTECTION

FIRST . . . *With Bennett carefully applied "Hi-Bake" linings, scientifically selected to properly hold your individual product.*

SECOND . . . *With Bennett's pre-tested containers and superior workmanship . . . the result of over 40 years of experience in steel container manufacture.*

Correct application methods usually account for the success or failure of a "Hi-Bake" container lining. Bennett has the most modern equipment, extensive research facilities and experienced personnel to assure you positive protection for your products. Extreme care is taken to follow only approved and pretested methods of application. Single coat as well as multiple coat lining applications are diligently checked for full coverage and proper thickness of each coat throughout the pail interior.

Bennett "Hi-Bake" lined pails will safely contain such active ingredients as paints, adhesives, insecticides, inks, foods, soaps, cleaning compounds, and most chemicals.

Bennett engineers welcome the opportunity to consult with you as to the proper type of "Hi-Bake" lining for your specific products. No obligation is involved. We will gladly submit lined sample pails for your own tests. Call or write us today for more information.

BENNETT INDUSTRIES
Peotone, Illinois

40 MILES SOUTH OF CHICAGO

Chicago Telephone INterocean 8-9480

Long Distance Peotone 2791

B BENNETT INDUSTRIES

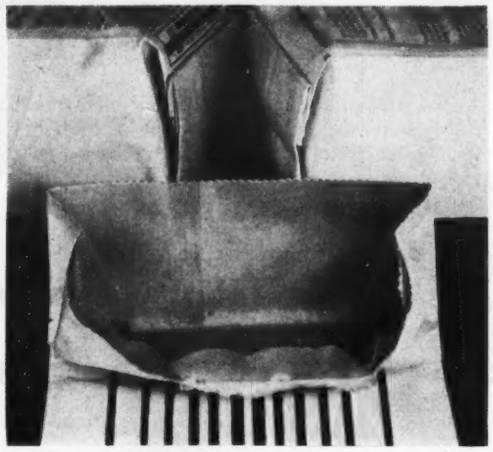
When inquiring check CP 5277 opposite last page

Fine-powdered products won't sift from paper bag . . .

bottom and top closures assure protection of quantities from 1 to 20 lb

Uses: Packaging insecticides, rodenticides, fertilizers, and other chemicals in quantities from 1 to 20 lb.

Features: Bag has a siftproof top and bottom closure accomplished by a combination of heat-sealing and gluing.



Details of bag's construction

Description: A composite bag, the Duo-Tite is made up of a natural or supercalendered bleached kraft outer shell and a liner of kraft or pouch stock that can be laminated with various materials for extra protection. To form bottom closure, bag is heat-sealed and folded once, a quick-drying paste is applied and another fold is made which glues to bag.

Through a special operation the same heat-sealed, pasted closure can be made by user on a machine built by the George H. Fry Co. of New York. The bag can be surface printed in one to four colors over either natural or bleached kraft.

(Siftproof paper bags are products of Shellmar-Betner Flexible Packaging Div., Continental Can Co., Dept. CP, 100 E. 42nd St., New York 17, N.Y. . . . or for more information check CP 5278 on handy form opposite last page.)

For more that's new in packaging . . . check the handy product directory (pages 217 to 220.) All the latest products, services, and ideas presented in this issue are listed there.

Have you changed your address recently?

● If so, you'll want to insure that your copy of CHEMICAL PROCESSING reaches you without interruption. Just send us your new address . . . use the handy form below.

Please answer all questions in regard to your new affiliation, and in addition give us your former address including company, city and state.

mail this request to
READER SERVICE DEPT.
CHEMICAL PROCESSING
111 East Delaware Place
Chicago 11, Illinois

Former Company Affiliation .....

Former Address .....

Your Name ..... Present Title .....

Present Company .....

Main Product .....

Rating of Company .....

Street Address .....

City ..... Zone No. ..... State .....

ACCURACY
SIMPLICITY
SPEED

BARTELT — NEW

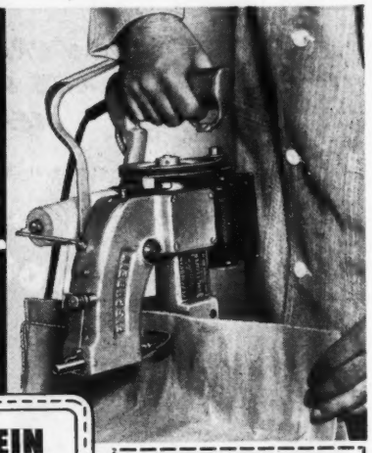
Checkweigher The Bartelt Checkweigher can *save you money* by assuring accurate weights without delaying production. It checkweighs containers at speeds up to 130 per minute, automatically rejecting off-weights to pre-selected weight differentials as accurate as plus or minus 1/60 of an ounce. Trouble-free performance, and low operating and maintenance costs are assured by the simplicity of construction. Let us send you all of the facts.

Write for folder today!

by **BARTELT** ENGINEERING COMPANY — ROCKFORD, ILLINOIS

When inquiring check CP 5279 opposite last page

FOR
FAST, SECURE, LOW COST
BAG CLOSING



FISCHBEIN *Portable* BAG CLOSER

- A *truly* portable bag closer . . . Weighs only 10½ pounds.
- Requires no installation . . . plug into any outlet.
- Handles textile and paper bags.
- Simple to operate and maintain.
- Lowest priced bag closer on the market.

FOR DETAILS, MAIL THIS COUPON NOW
DAVE FISCHBEIN CO.
Dept. 9B
38 Glenwood Ave. N.
Minneapolis, Minn.

Name.....
Firm Name.....
Address.....
City.....
State.....

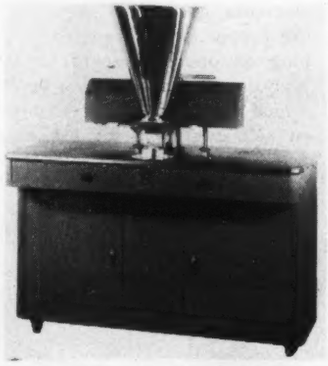
When inquiring check CP 5280 opposite last page

Accurate fill of powders assured by controlled vacuum . . .

dustless operation also a feature of unit

Uses: Filling glass bottles and jars, canisters, metal and fiber cans, plastic bottles and jars with free flowing and non-free flowing powders.

Features: Machine utilizes the controlled vacuum principle in which no powder enters container until pre-determined vacuum has been reached in container. There is no dribbling of material into container before filling operation is started. Operation is dustless and there is no carry-over of previous fill and no odor carry-over.



Self-contained filling unit requires no exterior water, air, or vacuum lines

Description: Filling machine, called the Model 185 Bag Filler, is a self-contained unit requiring no exterior water, air, or vacuum lines. It is available mounted on casters or with provision for permanent mounting.

Speed of fill depends largely upon kind of powder and size of container, but good production speeds are obtained. Changeover from one powder to another or from one kind of container to another is simple and fast.

(Powder filling machine is a product of Packaging Industries, Dept. CP, 50 Church Street, Montclair, N. J. . . . or check CP 5281 opposite last page.)

This EXACT WEIGHT Scale Checks Filled Bags FAST!

Right on your conveyor line, this EXACT WEIGHT Scale gives an accurate check in seconds of both open-end and valve-type bags. Because every bag is checked, costly over-weights can be completely eliminated. EXACT WEIGHT Scales weigh fast because of short lever fall and the action of an adjustable hydraulic damping device. They read fast, too, because of high-ratio visible indication. Model 1302-R can be installed on the floor or recessed into the floor, as shown. Also available with round commodity platter instead of rollers, or with sack rest. Write for details.

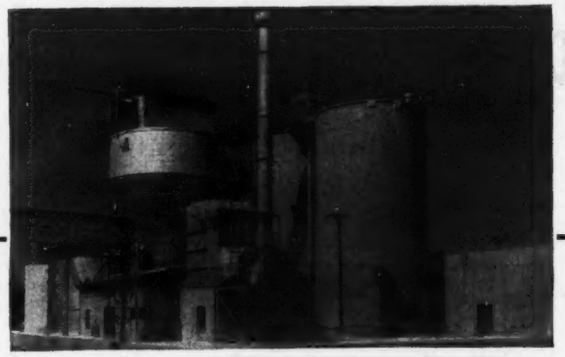
Sales and Service from Coast to Coast

Exact Weight Scales

Better quality control
Better cost control

THE EXACT WEIGHT SCALE COMPANY
905 W. Fifth Avenue, Columbus 8, Ohio
In Canada: P.O. Box 179, Station S, Toronto 18, Ont.

When inquiring check CP 5282 opposite last page



2 New Neff & Fry Storage Bins

These 30′ x 67′6″ Neff & Fry Bins were recently erected at the Sandersville, Ga., plant of The Thiele Kaolin Company for handling and storing spray-dried coating clays.

This is an example of the thousands of bins we have built to handle more than 80 kinds of flowable bulk materials—principally ashes, cement, clay, coal, grain, gravel, lime, limestone, ore, sand, and wood chips.

Our bins have many advantages which are explained in our interesting folder entitled, "Bins With the Strength of Pillars." A copy is yours for the asking. No representative will call except by invitation.

Request the folder now while it's on your mind.

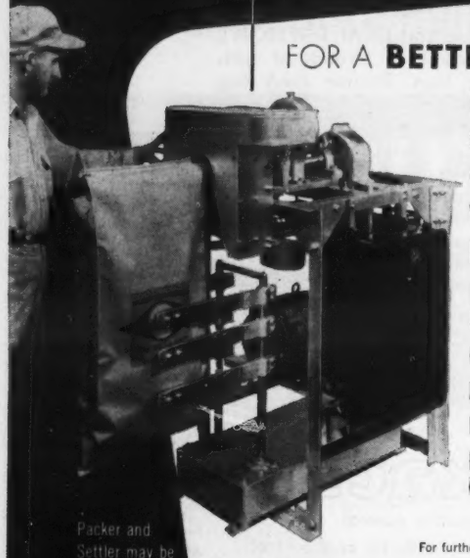
THE NEFF & FRY CO.
166 ELM ST. • CAMDEN, OHIO

NEFF & FRY — SUPER-CONCRETE STAVE STORAGE BINS

When inquiring check CP 5283 opposite last page

BLACK DIAMOND
VALVE BAG
packer & settler

FOR A **BETTER** PACKAGE...



investigate this new, sensational combination of automatic controlled weight valve bag packer and settler.

EASIER HANDLING & PALLETIZING
CLEAN—NO DRIBBLE
ACCURATE
ECONOMICAL
PERFORMANCE GUARANTEED

Packer and Settler may be purchased as separate units

For further information, write
BLACK PRODUCTS COMPANY
13513 Calumet Ave., Chicago 27, Illinois • Dept. P33
MANUFACTURERS SINCE 1912

When inquiring check CP 5284 opposite last page

We Don't Know All The Answers
BUT...

The long experience we at Taylor-Stiles have gained in engineering cutters to meet all types of industrial cutting requirements, from high volume production work to close precision cutting of an almost limitless variety of materials, enables us to provide intelligent answers to almost every cutting situation.

If you want to handle your cutting problem efficiently and economically, call or write to Taylor-Stiles.

Cutting element assembly shows the unique Taylor-Stiles shearing action that results in clean cut materials and that makes use of every ounce of power — a feature existing only in Taylor-Stiles cutters.

TAYLOR, STILES & CO
RIEGELSVILLE, NEW JERSEY, U. S. A.

When inquiring check CP 5285 opposite last page

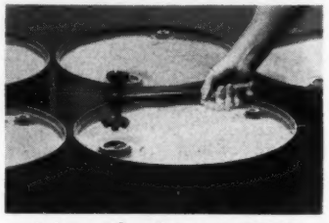
Built-in click is warning when drum closure is tight . . .

wrench slips when minimum torque reached

Uses: Correctly tightening 2 and ¾" plugs on steel drums.

Features: When minimum torque has been reached in tightening closure, wrench "breaks" or "slips". Further tightening can be done without harm to wrench or eventual lessening of torque. Heads worn from contact are readily replaced.

Description: Each preset torque wrench is factory set to eliminate guesswork on delivering proper fixed torque for a 2" plug on one side or for a ¾" plug on other side, but is so designed that head can only be used on side for which it has been originally set.



Only a 90° pull is necessary to deliver required torque on closure

Possible range of pressures or vacuums resulting from varying climatic conditions on packaged product (subzero to 140°F) differing from temperature at time of filling, determines amount of torque that should be applied to each size opening to fully protect it from leakage, breathing-in of moisture, and/or contamination.

To adequately tighten a 2" plug from "finger tightness", only a 90° pull is necessary to deliver torque that would be required to hold contents to over 40 psi and alternately 28" of vacuum.

(Preset torque wrenches are a product of Rieke Metal Products Corp., Dept. CP, 500 W. 7th St., Auburn, Indiana. Check CP 5287 opposite last page.)

THE ANSWER...

—to many

BAG CLOSING *problems!*

SEND for this new BULLETIN No. 201 which illustrates and explains how *Union Special Suspended Head Bag Closing Machines* can supply the answer to bag closing problems in small plants and large operations. Don't handicap your production with equipment that has limited capacity!

Union Special Bag Closers are designed to handle bags of heavy weight as well as light weight materials. These units are portable. Delivered to you complete with integral motor, thumb controlled clutch, automatic brake—ready to hang up, plug in, and go to work.

Send for this new Bulletin No. 201 NOW!

Union Special® MACHINE COMPANY
442 N. Franklin Street • Chicago 10, Illinois

When inquiring check CP 5288 opposite last page

"LIQUIDS WORTH STORING ARE WORTH MEASURING"
with a
LIQUIDOMETER
Tank Gauge

• FOR GAUGING LIQUIDS OF ALL KINDS
• 100% AUTOMATIC
• APPROVED BY UNDERWRITERS' LABORATORIES

WRITE FOR COMPLETE DETAILS

THE LIQUIDOMETER CORP.
38-18 SKILLMAN AVE., LONG ISLAND CITY, N.Y.

When inquiring check CP 5289 opposite last page

Economical table model filler and net weigher handles up to 20 packages per min . . .

units are available to fill weight range from two ounces to five pounds

Uses: Designed to fill almost any dry, relatively free-flowing product into any container.

Features: With a high degree of accuracy, table model Elec-Tri-Pak automatically weighs and fills up to 20 packages a minute. Although designed for economy, it has many identical features of the fully-automatic unit.

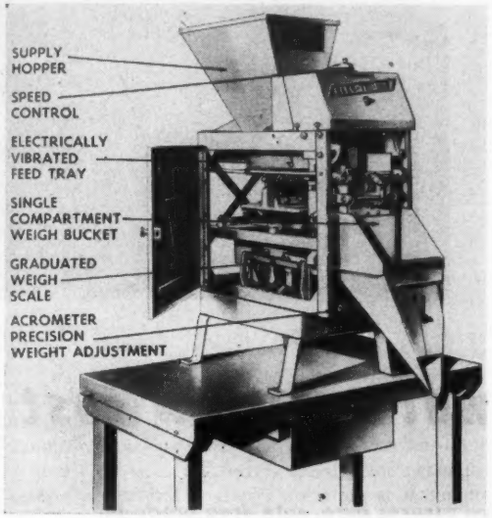


Table model filler has many features of automatic unit

Description: Components of net weigher-filler include vibratory feed tray, controlled-beam weigh scale, single compartment weigh bucket, speed control, and Acrometer weight adjustment. Units are available to handle a weight range from 2 oz to 5 lb. Machine is simple to operate.

(Weighing and filling machine is a product of Triangle Package Machinery Company, Dept. CP, 6633-55 W. Diversey Ave., Chicago 35, Ill. . . . or check CP 5290 on handy form opposite last page.)

Package design discussed

Description of company's package design and testing facilities is presented in 20-page illustrated booklet. Included is a packaging questionnaire for rating a packaging program.

"Creative Package Design" is available from The Hinde & Dauch Paper Co., Dept. CP, 5103 Decatur St., Sandusky, Ohio. When inquiring specify CP 5291 on handy form opposite last page.

Stack 'em up!

...and save storage space

Here's the lightweight, stainless steel acid container that builds a safe, compact stack—saves warehouse space and handling time for you. Bottom foot ring of the 15½-gallon Hackney Chemical Container fits snugly over top ring of lower barrel.

Designed with easy-to-grasp, full curled foot rings for safe, one-man handling and convenient pouring. Your name can be embossed on the bottom foot ring. Low tare weight reduces transportation costs. Stainless Steel protects your dangerous or perishable chemical products—eliminates breakage losses.

Write today for the Hackney Drum and Barrel Catalog.

Pressed Steel Tank Company

Manufacturer of Hackney Products

Hackney MILWAUKEE

DOWNINGTOWN IRON WORKS

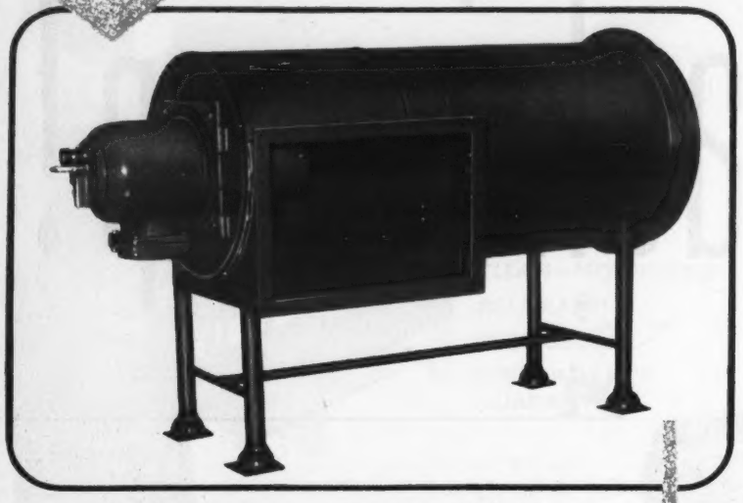
1463 S. 66th St., Milwaukee 14
52 Vanderbilt Avenue, Room 2087, New York 17
235 Hanna Bldg., Cleveland 15
936 W. Peachtree St., N.W., Room 126, Atlanta 3
208 S. LaSalle St., Room 796, Chicago 4
568 Roosevelt Bldg., Los Angeles 17
18 W. 43rd St., Room 19, Kansas City 11, Mo.

DOWNINGTOWN IRON WORKS, INC., DIVISION
144 Wallace Ave., Downingtown, Pennsylvania

CONTAINERS AND PRESSURE VESSELS FOR GASES, LIQUIDS AND SOLIDS

When inquiring check CP 5292 opposite last page

THERMAL TYPE CA
DIRECT FIRED AIR HEATERS



COMPACT . . . EASILY INSTALLED

Readily fitted to ovens, kilns, spray dryers, etc., the THERMAL Type CA Air Heater is an ideal source of heat where products of combustion may be mixed with the air. Oil, gas or combination firing is available without change in heater construction.

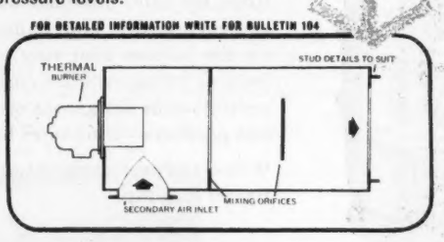
NO REFRACTORY REQUIRED . . .

The THERMAL High Velocity Burner built into the heater permits combustion to be substantially completed within the burner itself. Thus the heater is basically a mixing chamber wherein the products of combustion are mixed with the air being heated. Refractory is not normally used. Successful applications have been made ranging from under 200,000 BTU/hr. to over 20,000,000 BTU/hr. and at all pressure levels.

FOR DETAILED INFORMATION WRITE FOR BULLETIN 104

UNITIZED CONSTRUCTION

Initial cost and upkeep is kept at a minimum through the use of all welded, all metal construction. The CA Air Heaters are normally supplied as complete "package" installations.



OTHER THERMAL PRODUCTS & SERVICES → Gas, Oil & Combination Gas-Oil Burners • Heat Exchangers • Submerged Combustion • Combustion & Heat Transfer Engineering

THERMAL
Thermal Research & Engineering Corp.
CONSHOHOCKEN • PENNSYLVANIA
REPRESENTATIVES IN PRINCIPAL CITIES

When inquiring check CP 5293 opposite last page

Ultraviolet sterilizer (facing page) and demineralizer (by operator), plus a still, provide —

high-purity water at low cost

Schering Corporation assures pure, safe drug products, yet has negligible costs and virtually no maintenance with water treatment system

In the chemical and pharmaceutical manufacturing industries, it is axiomatic that the greater the degree of quality control, the higher the production costs. Thus, it is unusual when a plant has the ultimate in quality control yet saves money. An excellent example is the Bloomfield Plant of the Schering Corporation which produces ethical pharmaceutical preparations — specifically, bulk and unit preparations of parenterals, ophthalmic, and nasal products.

Two floors of the plant constitute the manufacturing section for the preparations mentioned above. Operations include preparing the glass containers and auxiliary closures, compounding, filling, sealing, sterilizing, and inspecting. The high standard of quality maintained throughout is best exemplified by the rigid control of the water that is used: a) as process water to compound the medicinals themselves; b) to wash the ampules, vials, bottles, and closures in which the products are packaged.

A combination of ultraviolet irradiation, deionization, and distillation are employed to assure water both chemically and biologically pure.

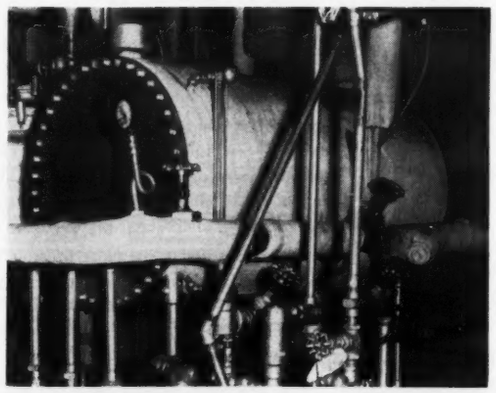
Ultraviolet irradiation provides an important advantage in that it reduces the count of viable organisms in the water charged to the demineralizer. Demineralization provides still another important advantage. By feeding only demineralized water to the still, troublesome still maintenance and attendant costly downtime are virtually eliminated.

In fact, Schering's still was recently taken down after a full year of operation and found to be exceptionally clean. Normally

this job would have to be done about every six months in the Bloomfield area; as often as once a month in locations where the water is very hard and demands on stills are heavy. Also, plant personnel know that the still is always operating at maximum efficiency when there is no scale formation.

Raw city water, containing 36 to 43 ppm hardness as $CaCO_3$ and the usual sedimentary impurities, enters the system at the rate of 60 to 90 gallons per hour. Initial treatment consists of filtration through standard ceramic filters followed by a pass through a bank of ultraviolet irradiating lamps in a specially

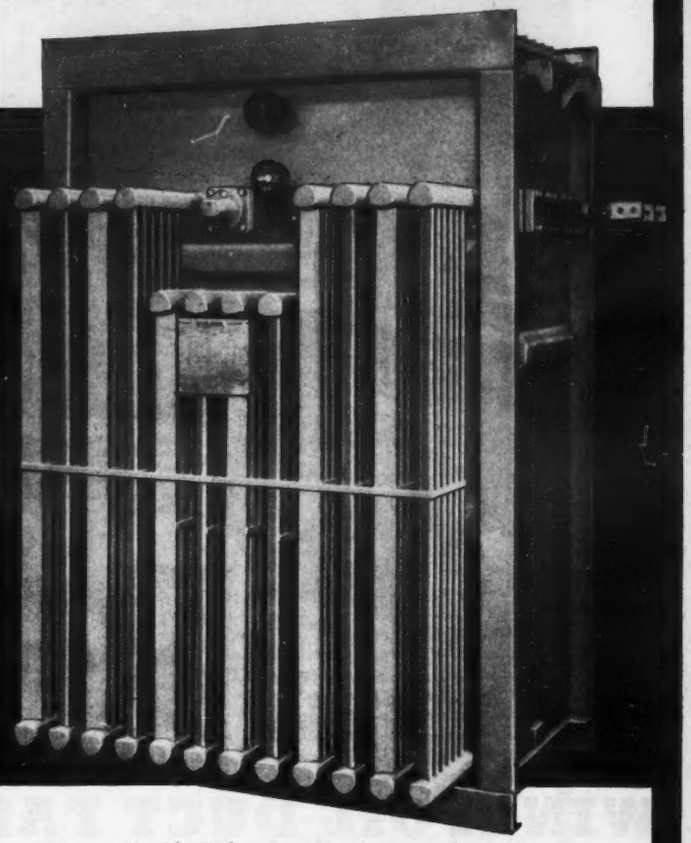
(*Continued on next page*)

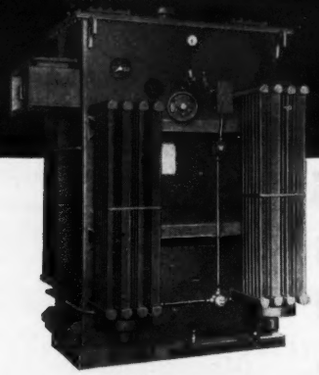


Only demineralized water is fed into this standard distilling unit, practically eliminating still maintenance

Wagner®
TRANSFORMERS
... the choice of leaders in industry

for space-saving load centers... specify Wagner Close-Coupled Unit Substation Transformers





Wagner

THROAT-CONNECTED UNIT SUBSTATION TRANSFORMERS

For outdoor installation, or for applications where it is desirable to locate the transformer away from the switchgear, Wagner can furnish these liquid-filled transformers in ratings to 2000 kva, 15 kv and below. Bulletin TU-13 gives full information.

Now, Wagner liquid-filled unit substation transformers are available in new, improved close-coupled units, rated from 300 to 2000 kva, that can be flush-mounted with any make of switchgear. They can be used in both single and double-ended unit substations to form neat, compact, streamlined substations for modern industrial service.

Bushings are provided on the ends of the close-coupled transformer for connection to the switchgear. The bushing heights are designed for a minimum distance from the base, giving ample room to make connection to switchgear or busses in the switchgear compartment or transition section.

In this type design it is not necessary to coordinate bushing height of transformer and switchgear as in the throat connected units which often require special throat heights to match special switchgear. This feature means that a standard transformer can be used for special switchgear application with a minimum of engineering coordination, resulting in shorter deliveries.

Look to Wagner for better transformers that assure a continuous, dependable flow of power. Your nearby Wagner engineer will be glad to help you solve your load-center problems. Call the nearest of our 32 branch offices, or write us.

Wagner Electric Corporation EST. 1891

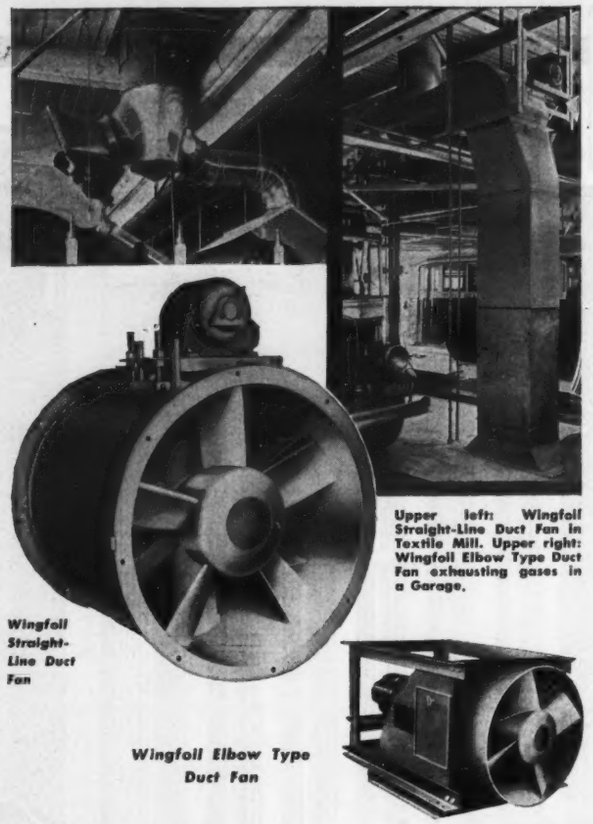
WAGNER ELECTRIC CORPORATION
6359 PLYMOUTH AVE., ST. LOUIS 14, MO., U.S.A.

BRANCHES AND DISTRIBUTORS IN ALL PRINCIPAL CITIES

ELECTRIC MOTORS
TRANSFORMERS
INDUSTRIAL BRAKES
AUTOMOTIVE BRAKE SYSTEMS—AIR AND HYDRAULIC

T55-2

When inquiring check CP 5294 opposite last page



Upper left: Wingfoil Straight-Line Duct Fan in Textile Mill. Upper right: Wingfoil Elbow Type Duct Fan exhausting gases in a Garage.

Wingfoil Straight-Line Duct Fan

Wingfoil Elbow Type Duct Fan

WINGFOIL DUCT FANS

DELIVER LARGE AIR VOLUMES WITH LOW POWER CONSUMPTION

The WINGFOIL Axial Flow Duct Fan, in either elbow or straight line type, is a compact, economical fan, designed to operate against static pressure. Both types have the motor outside the casing, unaffected by hot or dirty gases. Light weight, compact, easily handled, they may be inserted, as elbow or straight section, into a line of duct.

Write for Bulletin F-10-A

Wing

L. J. Wing Mfg. Co.

179 Vreeland Mills Road
Linden, N. J.
Factories:
Linden, N. J. and Montreal, Can.

When inquiring check CP 5295 opposite last page

(*Continued from preceding page*)

constructed Elenite twin-unit ultraviolet sterilizer which accomplishes a significant reduction in viable micro-organism count.

Thereafter, the water passes through a Penfield U-60, two-bed demineralizer where it is de-ionized to less than 5 ppm as $CaCO_3$. The only maintenance required on these units is the replacement of ultraviolet lamps every 6 months, and regeneration of the resin beds once a week. Total replacement of the resin beds is every nine months.

After demineralization, the water is given a second pass through an independent bank of ultraviolet lamps in the Elenite unit as a double check on microbiological purity.

Until recently, the water was then split into two streams: 1) part was diverted to heated storage tanks (80-90°C) from which it was drawn for use in preparatory washing of unit containers and closures; 2) part was diverted to a standard still unit for distillation to process quality water, including pyrogen-free water.

Now, however, seeking the ultimate in high-quality water for washing purposes as well as processing, Schering diverts all of its irradiated, demineralized water to the still. The water from the still unit destined for washing purposes is used immediately or collected and held in storage tanks at 80-90°C prior to use. Water from the still unit destined for use as water for injection is collected, and tested for compliance with U.S.P.

Aside from the investment in equipment, costs for water treatment are nominal. The system provides highest quality water for all uses, and assures consumer of getting the purest, safest product at lowest cost. Continuous production is thus maintained with virtually no maintenance problem.

(Ultraviolet irradiator is a product of Elenite Co., Dept. CP, 89 Franklin St., New York 13, N. Y. Check CP 5296 opposite last page.)

(U-60 two-bed demineralizer is produced by Penfield Mfg. Co., Inc., Dept. CP, 19 High School Ave., Meriden, Conn. . . . or check CP 5296A on handy form, opposite last page.)

(Distilling unit is manufactured by Barnstead Still & Sterilizer Co., Dept. CP, 2 Lanesville Terr., Boston 31, Mass. Check CP 5296B opposite last page.)

Explains boiler blowdown control

Principal kinds of boiler blowdown are discussed in eight-page technical paper. Also covered are various control methods necessary to assure production of pure steam.

Technical Paper No. 128 is available from W. H. & L. D. Betz, Dept. CP, Gillingham & Worth Sts., Philadelphia 24, Pa. When inquiring specify CP 5297 on handy form opposite last page.

CATALYST CONTAMINATION CURED BY REMOVING ENTRAINMENT IN DISTILLATION UNIT

Equipment Costing $15,000

Pays Out In Under A Week

For Large Southwestern Refinery

It was not a difficult problem to trace the cause of mounting catalyst losses to a cat unit feed so poor in color that it was essentially black. Entrainment of liquid from the bottom of the still column could be the only answer.

Here was a situation where a Metex Mist Eliminator would remove the entrainment —but what else might happen? Would this knitted wire mesh separator cause excessive pressure drop? How quickly would it become plugged by coke deposits and make the column inoperable?

Calculations by one engineer showed that the total cost of installing a 25-ft diameter Mist Eliminator, including designing and erecting supports within the still, was approximately $15,000—less than a week's catalyst loss. After considerable study the decision was made, and the Mist Eliminator installed during the next routine turnaround.

When the first run of cat unit feed came from the remodeled crude distillation unit, it was crystal clear and water white. Throughout the normal run no differential pressure across the screen was found. The problem was solved. Catalyst losses dropped sharply. And the Mist Eliminator has paid for itself in a matter of days.

Have you really analyzed your entrainment costs, and checked the savings a Mist Eliminator could make for you? Perhaps you are losing valuable end products in the exhaust stream. Perhaps you have a nuisance contamination problem. Perhaps the entrainment created in one vessel is causing trouble in a subsequent operation. For entrainment is an inevitable result of most processing and refining operations.

Metex Mist Eliminators perform just one function—and they are doing it in more and more refining vessels every day. They remove liquid entrainment—efficiently and economically—wherever it may occur.

Why not write today for more information on Metex Mist Eliminators. Or better yet, send data on your particular entrainment problem. We'll be glad to have our engineers check this, and send you our recommendations and suggestions. Metal Textile Corporation, Roselle, New Jersey.—(Adv.)

When inquiring check CP 5298 opposite last page

Surface remains slip-proof when wet or dry . . .

coating which forms tightly bonded veneer is non-toxic, resistant to water, oils, fats

Plastic material which contains special solvents and abrasive fillers can be quickly troweled on steps and floor surfaces made of concrete, wood, steel, tile, mastic, or terrazo. When applied, it is said to form a thin, tightly bonded veneer that is slip-proof, wet or dry, and which contributes to the elimination of accidents.

Safety topping being applied to plant steps

Available in tile red, green, light gray and dark gray the coating furnishes a surface which, according to manufacturer, is decorative, resilient, non-toxic, fire retardant, and stands up well even under steel wheel trucking.

(X-L Veneer is a product of The Monroe Co., Inc., Dept. CP, 10703 Quebec Ave., Cleveland 6, Ohio . . . or check CP 5299 on form opposite last page.)

Your guide to more ideas concerning Engineering and Maintenance . . .

is the handy Product Directory on pages 217 to 220. All products and services discussed in this issue, in either editorial or advertising, are listed there.

New *simplicity and sustained efficiency in dust filtering and collection . . .*

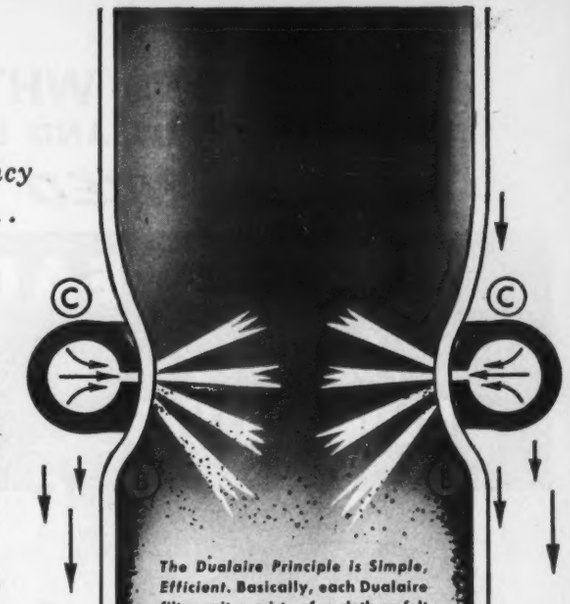
Dualaire*

REVERSE-JET DUST COLLECTOR

Efficiencies up to 99.99%

Cloth filter systems of one design or another have long been used by industry for cleaning industrial gases and/or recovering dust or other suspensions. But three problems are common to such systems... (1) Extreme changes in pressure drop and filtering efficiency as dust cakes accumulate on the filter surface... (2) Wide pressure fluctuations and surges in the plant system as filter units become clogged or are cut out and rapped for cleaning... and (3) Rapid deterioration of the filter material by the vibration, shaking and rapping equipment used for cleaning.

But now the DUALAIRE Collector—as engineered by Western Precipitation, pioneers in the field of dust recovery—provides the answer to these and other problems common to conventional bag-house equipment.



The Dualaire Principle is Simple, Efficient. Basically, each Dualaire filter unit consists of a cloth or felt tube, open at both the top and bottom. (A) Dust-laden gases enter at top of the tube and are filtered as they pass through the side walls of the tube to the exhaust system. (B) Dust particles collect on the inside of the tube and *before* the cake builds up sufficiently to affect filter operation, a tubular blow ring (C) automatically starts moving up and down the outside of the filter cylinder. A jet of air, concentrated by this blow ring, reverses the normal gas flow at the point contacted by the ring, thus jetting the dust layer off of the inner surface of the filter tube.

This jetting action is further assisted by a flexing of the filter cylinder as the blow ring passes, thus cracking and loosening the dust layer from the inner surface, from where it drops to the recovery chamber below the bottom of the tube.

The entire operation is positive and simple. The blow ring starts its action *automatically* as soon as the dust layer causes a pre-determined pressure differential. And after the filter surface is cleaned, the blow ring *automatically* stops.

6 ADVANTAGES OF DUALAIRE DESIGN...

PRESSURE DROP remains uniformly low at all times because the dust is removed continuously in *small portions.*

FILTERING EFFICIENCY remains uniformly high at all times without the "choking" action characteristic of conventional bag-houses. Actual field tests show efficiencies as high as 99.99%!

DUST RECOVERY is in steady increments — not in sudden large "batches" as with conventional rapping systems. Thus the Dualaire eliminates surges and detrimental variations in the plant system.

FILTER ELEMENT has a much longer life because it is not subjected to the stresses of rapping or jarring while being cleaned. Dualaire reverse-jet cleaning action is gentle, yet far more effective.

GREAT SAVINGS are also made in space and the size of installation required. Because each Dualaire filter unit is cleaned more-or-less constantly without shut-down, there is no need for costly standby units — or the complicated switching equipment to cut standby equipment in and out.

BASIC UNITS are "sectionalized" and are available in 5 standard heights. Sections can be bolted together in any desired multiple, providing a capacity range to fit virtually any requirement. As needs increase, add more sections.

There are many other advantages built into the DUALAIRE. *For further details send for this descriptive 12 page booklet. Or contact your nearest Western Precipitation representative!*

WESTERN Precipitation CORPORATION

DESIGNERS AND MANUFACTURERS OF EQUIPMENT FOR COLLECTION OF SUSPENDED MATERIALS FROM GASES & LIQUIDS

Main Offices: 1023 WEST NINTH STREET, LOS ANGELES 15, CALIFORNIA
CHRYSLER BLDG., NEW YORK 17 • 1 N. La SALLE ST. BLDG., CHICAGO 2
1429 PEACHTREE ST. N.E., ATLANTA 5 • HOBART BLDG., SAN FRANCISCO 4
PRECIPITATION CO. OF CANADA, LTD., DOMINION SQ. BLDG., MONTREAL

* ® "Dualaire" & "Multiclone" Licensed by H. J. Hersey, Jr.

When inquiring check CP 5300 opposite last page

No. 2* of . . .

12 REASONS WHY
YOU SHOULD BUY AND USE
LOW-PRICED

HOMESTEAD
Lubricated
PLUG VALVES
Pat. Pending

HOMESTEAD'S EXCLUSIVE, COMPLETELY CONTROLLED HIGH-PRESSURE LUBRICANT SYSTEM

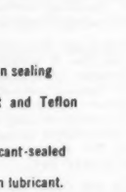
. . . forces chemical seal over all seating surfaces; prevents any possibility of sticking by momentary piston-like action of plug which is moved downward and returned instantly against packing ring. Provides 100% seal around ports; guarantees a completely filled system.

This is only **ONE REASON WHY** you should buy and use, *low priced* **HOMESTEAD LUBRICATED PLUG VALVES.**

HERE ARE ALL TWELVE

1. Reinforced Teflon packing ring.
2. Completely controlled high-pressure lubricant system.
3. 100% pipe area or venturi patterns.
4. No spring torsional stress.
5. No mechanical adjustments.
6. Two lubricants handle most services.
7. Extremely close tolerance between sealing surfaces.
8. Triple head-seal with Lubricant and Teflon packing ring.
9. Plug floated on Teflon washer.
10. Leak-proof double-ball and lubricant-sealed check valve.
11. Full-threaded screw assures clean lubricant.
12. Extruding lubricant shows when system is full.

FOR CATALOG AND COMPLETE DETAILS MAIL COUPON TODAY



Without obligation, send Reference Book 39—Section 5 on HOMESTEAD LUBRICATED PLUG VALVES.

NAME _____ TITLE _____

COMPANY _____

ADDRESS _____

CITY _____ STATE _____

HOMESTEAD VALVE MANUFACTURING COMPANY
Serving Since 1892

P. O. BOX 140 CORAOPOLIS, PA.

When inquiring check CP 5301 opposite last page

Manual offers report on pellet-type $CaCl_2$

Manual of sixty pages gives report on pellet-type calcium chloride. It explains why and how material permits transportation, storage, and mechanical handling of calcium chloride in bulk. Data on properties, specifications and applications are included.

Manual entitled "Peladow" is available from Inorganic Sales, Dept. 1, The Dow Chemical Co., 1000 Main St., Midland, Mich. When inquiring specify 5302 on handy form opposite last page.

Non-abrasives handled by easily-erected spout . . .

assembled of aluminum alloy, units are dust-proof

Uses: Spouting non-abrasive materials.

Features: Spout is easily and economically erected with unskilled labor. File, hacksaw, and hammer are the only tools needed. Assembled unit takes less space and is easily cleaned and maintained.

Spout can be dismantled quickly and reused elsewhere

YOU CAN SOLVE YOUR TOUGHEST SEALING PROBLEMS WITH R/M Teflon*

In thousands of plants all over the country, products made of R/M "TEFLON" are licking problems once thought unsolvable. Take R/M Packing No. 845. Here you have a valve stem packing that's *absolutely foolproof* for chemicals and solvents up to 500°F. A few years ago such a product was completely unknown.

Ever since this plastic was first produced, R/M engineers have been living with the problems that "TEFLON" can lick. Any trouble you may be having they've probably already encountered—and have worked out the right solution. For complete details on the R/M "TEFLON" products line, call on your R/M distributor.

**Du Pont's trade-mark for its tetrafluoroethylene resin*

R/M **PACKINGS**

RAYBESTOS-MANHATTAN, INC.
PACKING DIVISION, MANHEIM, PA.

When inquiring check CP 5303 opposite last page

CRESCENT ARMORED MULTITUBE
In 3 Corrosion Resistant Types

For Pneumatic and Hydraulic Instruments and Control

TYPE CT—For damp or corrosive locations, where a moderate degree of mechanical protection to the tube is required. It employs a corrosion-resistant thermoplastic sheath, resistant to water, acids, alkalies, oil, and is flame-retardant.

TYPE CTA—Where maximum mechanical protection is desired during and after installation, such as direct burial in wet concrete and for pulling into conduit.

TYPE CAT—For maximum protection against corrosion and mechanical injury to the tubing.

CRESCENT ARMORED MULTITUBE consists of long-length tubes twisted together to permit bending without distortion. In each layer, one tube is a bright blue color, affording a fast means of identification from both ends.

Available in long runs of copper, aluminum and polyethylene tubing in size ¼" O.D. This product is licensed under U. S. Patent No. 2,578,280.

SEND FOR BULLETIN

CRESCENT
INSULATED WIRE & CABLE CO.
TAYLOR STREET, TRENTON 5, N. J.

When inquiring check CP 5304 opposite last page

Description: Complete Robinson Pneu-Spouts are assembled with seamless tubing, adjustable elbows, angles, and fiittings all made of aluminum alloy of a hardness that will give long life. Assembly can be dismantled quickly and reused elsewhere with a minimum of waste.

(Spout for non-abrasive materials is a product of Thomas Robinson and Son Ltd., Rochdale, England and is distributed by The Day Company, Dept. CP, 852 Third Ave., N.E., Minneapolis, Minn. . . . or for more information check CP 5305 on handy form opposite last page.)

Small motor pulley offers 2/1 ratio up to 1/3 hp . . .

lubrication isn't necessary

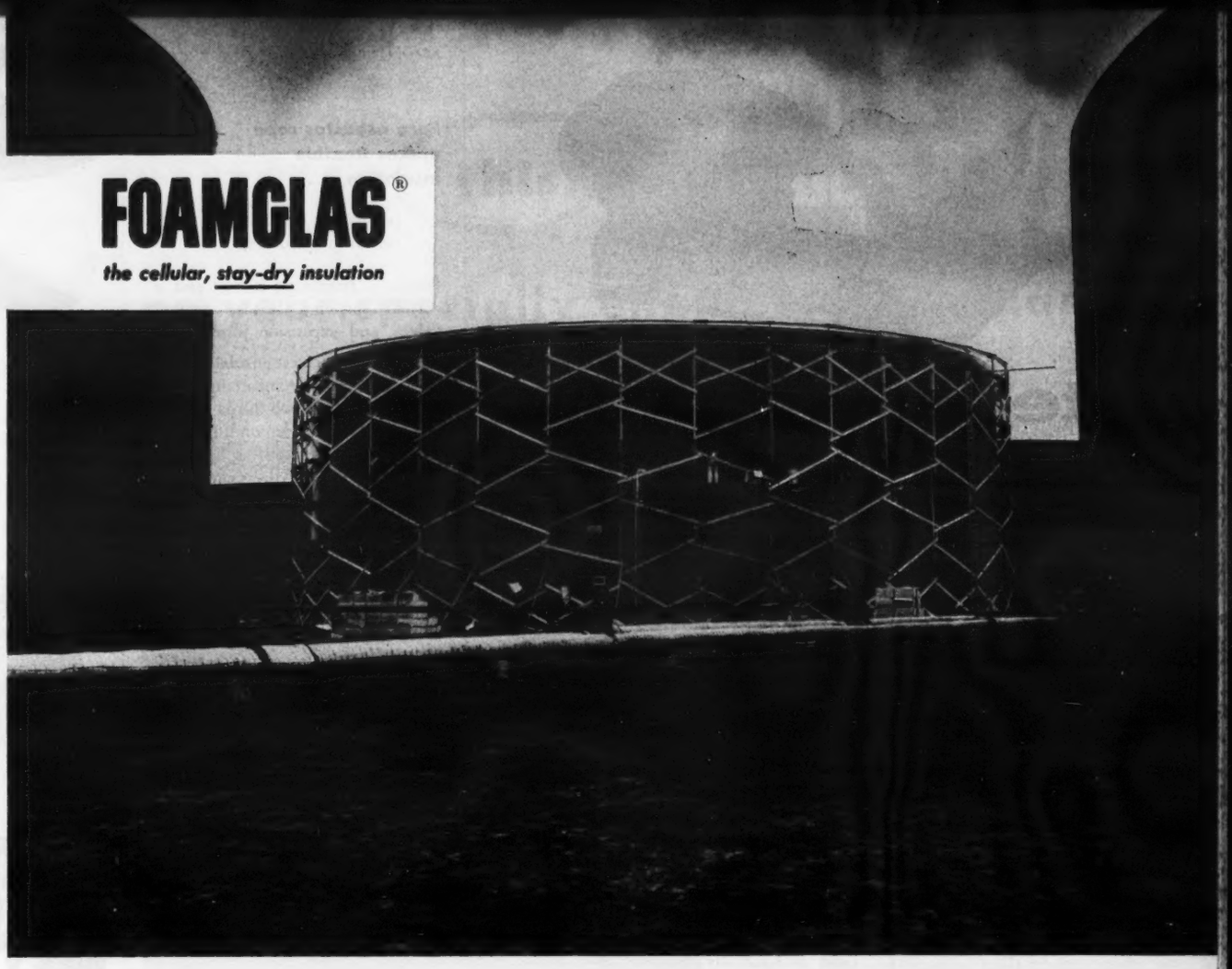
Uses: On blowers, conveyors, and other machinery on which infinite and automatic variable speed is desired.

Features: Pulley offers a 2:1 speed ratio up to 1/3 hp. Oil-impregnated bearings eliminate necessity of lubrication. Through shaft mounting is easily accomplished.

Description: Variable-pitch motor pulley, designated #30 Var-'A'Cone, is smooth running and durable. It is machined of cast iron rather than being made of plastic, die castings, or stampings. Standard "A" section belts are used and maximum hp rating is 1/3 at 1750 rpm. There are no inter-locking discs on pulley to chew up belts.

(Variable-pitch motor pulleys are products of Gerbing Mfg. Corp., Dept. CP, 11800 Milwaukee Ave., Northbrook, Ill. . . . or for more information check CP 5306 on convenient Reader Service slip opposite last page.)

For more information on product at right, specify CP 5307 . . . see information request blank opposite last page.



Only FOAMGLAS insulation can stay dry at 120°F on these fuel oil storage tanks

FUEL OIL CORPORATION officials faced a serious problem when their supply of steam needed to heat heavy fuel oil at River Rouge, Michigan was curtailed. They solved it by insulating their four massive storage tanks with FOAMGLAS to cut the volume of steam required to heat the oil. They say:

"We picked FOAMGLAS because it can't absorb the moisture that cuts insulating efficiency. This was most important since the 120°F temperature of the stored oil could not dry out moisture that might be absorbed by ordinary insulations. With FOAMGLAS, we get constant insulating efficiency to keep oil heating steam requirements at a money-saving minimum.

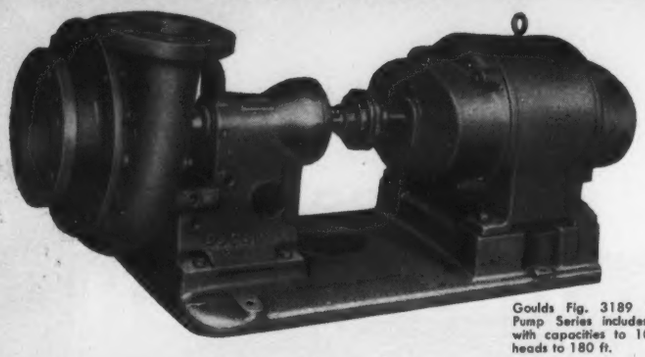
"We save money, too, because we get this lasting insulating protection without high insulation replacement and maintenance costs. Even oil spillage and corrosive industrial atmospheres can't damage fireproof, acid-proof FOAMGLAS."

It will pay you to find out today how you, too, can save money by using FOAMGLAS. Write for our booklets on insulation for piping, tanks and other equipment.

Flat 2" blocks of FOAMGLAS are applied to surface of 117' dia., 41' high tank. Blocks were banded in place then sprayed with coat of asphalt cutback. Insulation Contractor was G. H. Gotshall Co., Detroit, Michigan.

Pittsburgh Corning Corporation

Department CP-25, One Gateway Center
Pittsburgh 22, Pennsylvania
In Canada: 57 Bloor St. W., Toronto, Ontario



Goulds Fig. 3189 Centrifugal Pump Series includes 10 sizes with capacities to 1080 GPM; heads to 180 ft.

interesting facts

...about a new series of Goulds Multi-Purpose Centrifugal Pumps

Newest in a line of heavy-duty centrifugal pumps reputed for their dependable, trouble-free operation, the Goulds Fig. 3189 Series offers you:

Versatility — You can use the Fig. 3189 single-stage, open impeller pumps for general water service, irrigation, circulation, slurries, transfer, factory wastes and for air conditioning. You can choose just the right pump for your need from 10 sizes with capacities ranging up to 1080 gallons per minute, with heads up to 180 feet at 1750 RPM.

Economy — The Fig. 3189 Series is made in the Goulds tradition—they're built to work hard and to last long. Their design accommodates wide interchangeability of parts, greatly reducing parts inventory requirements where many pumps are used.

Low Operating Cost — Modern hydraulic design provides high operating efficiency with relatively low power consumption. Impellers are statically and hydraulically balanced for smooth operation.

Operating Convenience — You can adapt the Fig. 3189 pump to various piping arrangements by swiveling the discharge nozzle to any one of three positions.

Maintenance Convenience — Wide openings in the support head give ready access to gland and stuffing box. Bearing housing is completely sealed to exclude moisture and dirt. *You can safely use the unit outdoors without fear of dirt harming the bearings and you can hose it down without fear of water damage.*

For specifications, performance curves and other interesting design details that contribute to long, economical service, send for illustrated Bulletin 720.4.

MEMBER

Goulds PUMPS INC. Seneca Falls New York

ATLANTA • BOSTON • CHICAGO • HOUSTON • NEW YORK
PHILADELPHIA • PITTSBURGH • TULSA

When inquiring check CP 5308 opposite last page

Pure asbestos rope makes flexible insulation . . .

is effective up to 1200°F, can't rot or deteriorate

Uses: Insulating curved and irregular piping, bends, fittings, valves, and expansion joints.

Features: Flexible insulation contains no organic reinforcing fibers. It is one-half to two-thirds lighter; heat transfer is correspondingly less; and, size for size, there are from two to three times as many lineal feet per pound.

Rope cannot rot or deteriorate and insulates effectively up to 1200°F. It can be removed and reapplied at temperatures to 750°F.

Description: Rope, called Caposite, is 100% chemically pure long-fiber Amosite asbestos rovings, twisted together to correct diameter and retained within a braided reinforcing jacket of asbestos yarn. It is available in 100′ coils, ½ to 2″ diameters.

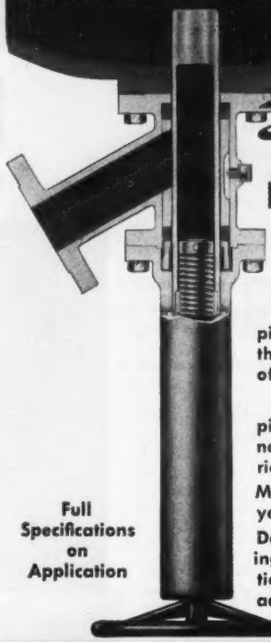
(Asbestos rope insulation is a product of North American Asbestos Corp., Dept. CP, Board of Trade Bldg., Chicago 4, Ill. Check CP 5309 opposite last page.)

Non-shrink grouting method outlined

Successful grouting of heavy equipment with non-shrink mortar is described in 16-page folder. Literature outlines and illustrates what mortar is, some common methods of grouting different kinds of equipment, mixing and placing of grout, cold and hot weather grouting, and measurable characteristics of mortar. Recommended mixes and estimating tables plus illustrations of actual installations are included.

Bulletin E-lc is available from The Master Builders Co., a subsidiary of American-Marietta Co., Dept. CP, 7016 Euclid Ave., Cleveland 3, Ohio. Specify CP 5310 opposite last page.

NO RODDING NECESSARY!



Strahman RAM TYPE Drain Valves

The Only Drain Valve That Cannot Clog Up!

In the closed position the piston or ram extends up into the tank, preventing plugging of the outlet.

In the open position with piston fully retracted, there is no resistance to flow of materials drained from the tank.

Made in any cast metal to meet your requirements.

Designed for bolting to existing flanges. For special adaptations and for jacketed vessels, adaptor pads are available.

Full Specifications on Application

STRAHMAN VALVES, INC., 16 HUDSON STREET NEW YORK 13, U.S.A.

When inquiring check CP 5311 opposite last page

Announcing... MOLYKOTE® MICROSIZE

The "finest" molybdenum disulfide lubricant available.

With average particle sizes of less than one micron, MOLYKOTE MICROSIZE has the physical ability to enter the smallest spaces between mating parts to fully exploit the basic lubricating features of MoS_2 at extreme bearing pressures and temperatures.
Economically, too, the covering ability of MOLYKOTE MICROSIZE is far superior to ordinary grades of molybdenum disulfide powder

"Information on MOLYKOTE appears in Sweet's Product Design File, 1955, Section C."

For more detailed information, write today for our Bulletin 104.

THE ALPHA CORPORATION
65 Harvard Ave. • Stamford, Conn.

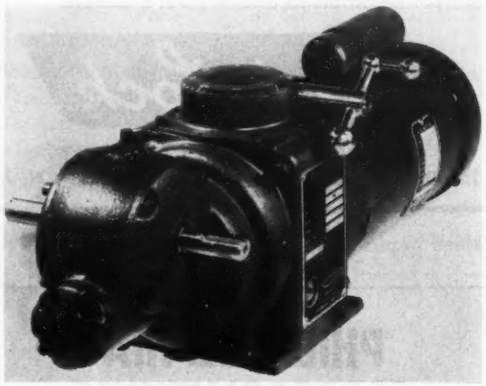
When inquiring check CP 5312 opposite last page

Small transmissions can be used in low-speed, heavy-duty applications . . .

worm reducer assembly is standard equipment on 1/6 and ¼ hp variable-speed units

Powerful worm reducer assembly is available as standard equipment with company's infinitely variable-speed transmissions in 1/6 and ¼ hp sizes.

Reducer can be furnished with double output shaft extension or can be had with single shaft extension horizontal or vertical, up and down. Several worm ratios are available in this assembly including 5:1, 12:1, 23:1, 45:1, and 60:1, providing a range of speeds from 550 rpm to zero, to 10 rpm to zero, inclusive.



Reducer can be furnished with double output shaft extension

Worm gear is of phosphor bronze. Worm is alloy steel hardened and ground. Oversize ball bearings support worm and worm gear shafts and are designed to take heavy thrust and overhung loads. Ball bearings replace sleeve bearings used in worm reducer that unit replaces. Spring-loaded oil seals replace felt seals used in earlier model, and center distance between shafts is increased 60%.

Entire assembly of reducer, variable-speed transmission and motor is mounted with only four bolts. This reduces installation costs and makes a more compact assembly.

All speeds from any desired maximum to zero are available at a turn of the hand-wheel. Micrometer control shown in photo is standard with transmission and makes it possible to accurately reset to a predetermined speed.

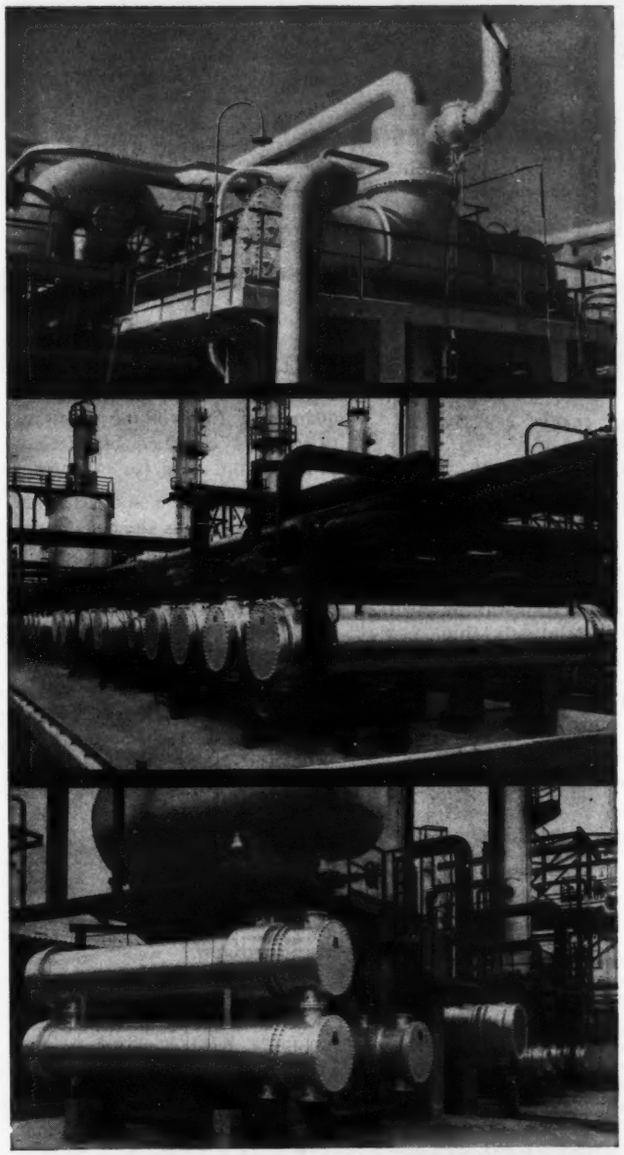
(Worm reducer assembly is a product of Graham Transmissions Inc., Dept. CP 227 E. Fourth St., Menomonee Falls, Wisconsin . . . or for more information concerning this product, reader may simply check CP 5313 on the handy Reader Service slip which is opposite last page.)

this...

ROSS

KEWANEE-ROSS PRODUCTS

on your specially engineered exchanger means BONUS VALUES



Specially engineered exchangers designed and built by Kewanee-Ross embody features and services that have long been acclaimed throughout the refinery and petrochemical industries. "Bonus values" . . . they're called.

Characteristic Kewanee-Ross standardization is one of them. Substantial delivery time and savings in engineering costs can often be gained through the suitability of standard components for many specially engineered units.

A large stockpile of engineering experience is another. Kewanee-Ross engineers have had long experience with many special and unusual applications. Designing and production are off to a faster start.

Long a leader in the heat exchanger and surface condenser fields, Kewanee-Ross is today in the best position of its history to meet your requirements. Now, with the added capacity of a second large plant (Kewanee, Ill.), recently re-equipped with completely modern machinery and supervised by key "Ross trained personnel," Kewanee-Ross is ideally situated to supply all types of heat exchangers, built to any code, on a very favorable delivery schedule.

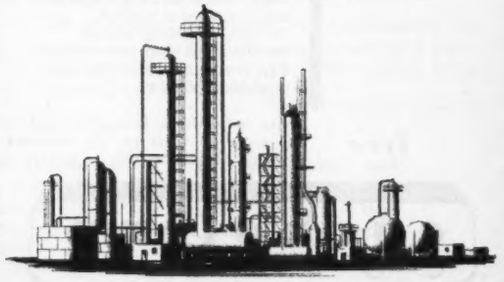
Arrange an immediate consultation with the Kewanee-Ross representative nearest you, at your earliest convenience. You have only your time to invest.

KEWANEE-ROSS CORPORATION

DIVISION OF AMERICAN RADIATOR & STANDARD SANITARY CORPORATION

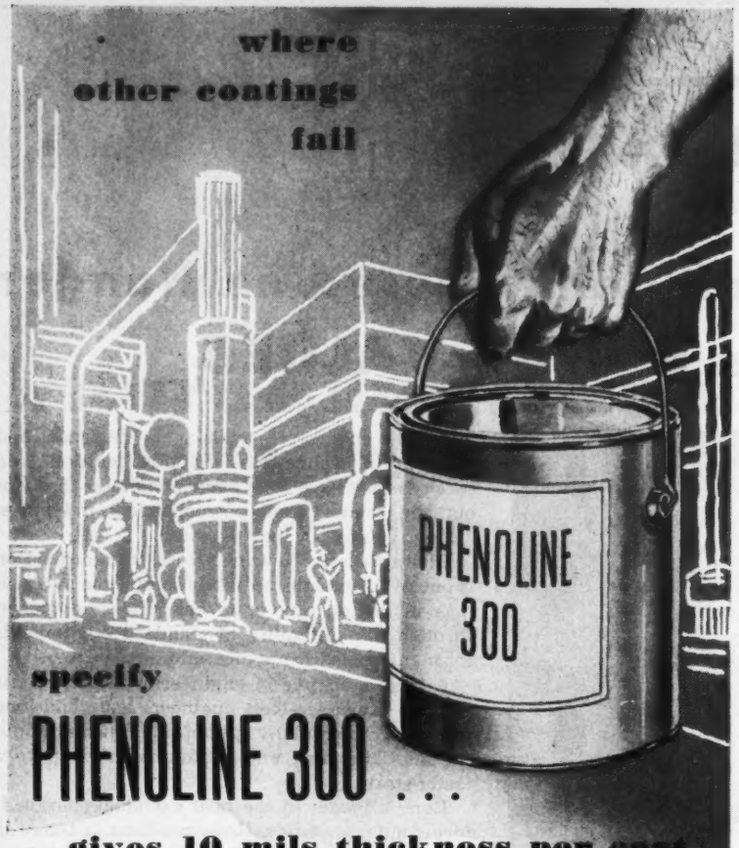
1403 WEST AVENUE • BUFFALO 13, N. Y.

In Canada: Kewanee-Ross of Canada Limited, Toronto 5, Ont.



Serving home and industry: AMERICAN-STANDARD • AMERICAN BLOWER • CHURCH SEATS & WALL TILE • DETROIT CONTROLS • KEWANEE BOILERS • ROSS EXCHANGERS • SUNBEAM AIR CONDITIONERS

When inquiring check CP 5146 opposite last page.



specify

PHENOLINE 300 . . .

gives 10 mils thickness per coat

for heavy duty protection of steel in severe corrosive environments

Heavy duty protection is required for areas in chemical processing plants and other industries where *severe* corrosive conditions are present (high fume concentration, heavy splash and spillage). Vinyls and other relatively thin coatings, which do not give heavy duty protection, fail in these environments.

But Phenoline 300 (a modified thermosetting phenolic) gives you this vital protection and saves you money, too. Here's why:

- 10 mils (.010") thickness per coat. This means fewer coats required, lower application cost.
- Highly resistant to acids, alkalies, solvents.
- 100% solids—no special ventilation necessary during application.
- Can be sprayed or brushed.
- Air dries—no baking required.
- Resists sudden temperature changes.
- Easy to wash down and keep clean.
- Available in all colors.

free write today for information and literature, including results of impartial tests on 15 different protective coatings, including Phenoline 300, in severe corrosive atmosphere.

carboline COMPANY

A Division of Mullins Non-Ferrous Castings Corporation

Specialists in Corrosion Resisting Synthetic Materials

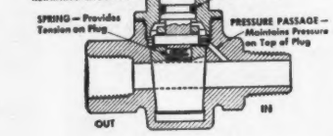
333 Thornton Ave., St. Louis 19, Mo.

When inquiring check CP 5315 opposite last page

Plug lifting eliminated by pressure passage in valve

Uses: Pneumatic applications, fluid transmission systems, instrumentation, and similar uses.

Features: Internal construction of valve includes a pressure passage which maintains constant line pressure on top of plug, thereby eliminating any possibility of plug lifting. Floating stem promotes perfect alignment of plug in body. Stem is sealed against leakage by an O-ring. Retaining shoulder on stem makes it impossible to lift.



Description: Plug valve is recommended for working pressures to 300 psi. Convenient brackets are provided on valve for mounting.

Plug is made of a special nickel silver alloy and is double ground to prevent leakage or seizure. Positive stop assures full opening. Two different styles are offered — male to female, and male to male pipe thread — in three different pipe thread sizes, ⅛", ¼", and ⅜".

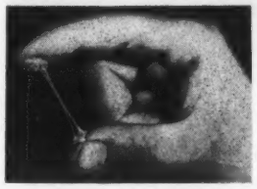
(Plug valves, 200 Series Hi-Duty, are products of The Imperial Brass Mfg. Co., Dept. CP, 1200 W. Harrison St., Chicago 7, Ill. Check CP 5316 opposite last page.)

Line blind series standardized

Dimensions and specifications of a standard series of line blinds, called Micro-Blanks, are given in 10-page catalog.

Cat MB-1-2M is issued by M. N. Aitken Co., Dept. CP, 5960 Kansas St., Houston 7, Tex. Specify CP 5317 opposite last page.

WHAT PIPE JOINT COMPOUND WOULD YOU SPECIFY TO HOLD . . .



Tacky enough to hold on to any type of surface

PERCHLORETHYLENE, TOLUENE, "FREONS"®, ACETIC ANHYDRIDE?

Leak Lock joint compound, with five years use in the chemical, refrigeration and aircraft industries, may be the answer to your "unsolvable" leaking joint problems.

Leak Lock has other unusual chemical properties . . . great adhesion and flexibility. It will resist almost everything except lower alcohols and caustic solutions. Ask us about your joint compound problems and request a sample.

Leak Lock

HIGHSIDE CHEMICALS COMPANY
16 COLFAX AVENUE, CLIFTON, N. J.

When inquiring check CP 5318 opposite last page

PHILADELPHIA COPPERSMITHING COMPANY

ENGINEERS
QUALITY FABRICATORS

PROCESS EQUIPMENT FOR THE CHEMICAL AND PHARMACEUTICAL INDUSTRIES

ALL METALS

POPLAR, FRONT & BROWN STS.
PHILADELPHIA 23, PENNA

ESTABLISHED 1898

When inquiring check CP 5319 opposite last page

Extreme temperatures won't affect dry film lubricant which is bonded to surfaces . . .

material can be applied to metals, plastics, wood, glass, or ceramics

Uses: Lubrication of iron, steel, aluminum, nickel, or alloys; plastics, wood, glass, or ceramics.

Features: Film formed by dry lubricant is unaffected by extreme temperatures, by most loads or high speeds, by vacuums, or by most solvents. It is clean and permanent for most uses. It does not spatter or soil and needs no renewal.

Description: Permanent solid-film dry lubricant, called Electrofilm Lube-Lok, is available in several compounds. It contains graphite, some molybdenum disulfide, and other similar materials or combinations. Lubricative elements are blended with a thermosetting resin. When "set" by baking, lubrication is bonded in place.

Nature of resin is such that it makes a strong bond with metal. For proper adherence, mechanical or chemical means are used to create an etched surface before coating is applied.

Application of Electrofilm is by licensed job shops.

(Dry lubricant is a development of Pyrene -C-O-Two, Dept. CP, 10 Empire Street, Newark 5, N.J. . . . or for more information check CP 5320 on handy form opposite last page.)

Sunlight doesn't harm pipe made with non-toxic polyethylene base . . .

formulation permits use above or below ground, in applications where flexibility counts

Uses: Conveying potable liquids, slurries, chemicals, and also for use as electrical conduit.

Features: Polyethylene-base flexible plastic pipe is designed to eliminate deteriorating effects of sunlight. It is non-toxic and resistant to electrolytic corrosion, rust, and rot. Friction loss is low and there is no interior build-up with use. Pipe may be used above or below ground.

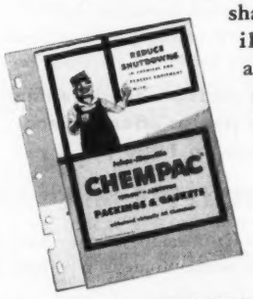
Description: This all-purpose plastic pipe is flexible enough to permit bending around most obstacles without kinking and is light in weight. It is furnished in nine standard sizes up to 6" in diameter, and is shipped in continuous coils up to 400' in length depending on diameter. A complete line of fittings is available.

(Sunlight-resistant plastic pipe is a product of Munray Products, Inc., Dept. CP, 12400 Crossburn Ave., Cleveland 11, Ohio . . . or for more information check CP 5321 on handy form opposite last page.)

Now—J-M Chempac-Interlocked Packing combines both "Teflon" and asbestos protection

Johns-Manville now introduces Chempac®-Interlocked Packing, with three important advantages for service in chemical and process equipment. Interlocked provides the excellent sealing and heat resistant qualities of asbestos. It is braided by the unique and exclusive J-M method, so that the asbestos yarns are securely interlocked and cannot come apart in service. And it is treated with chemically inert Teflon*, which is almost universally resistant to chemical and solvent action.

Chempac-Interlocked can be used to pack pump rods or shafts, rotary filters, mixers and similar apparatus handling strong acids, alkalis, caustic solutions and many other reagents at temperatures to 500F.



Other J-M Chempac Packings and Gaskets for the Chemical and process industries

J-M Chempac Packings in coil, spiral and ring form. Made of asbestos, treated with Teflon, they are available in types for caustic, acid, chlorine and solvent service.

J-M Chempac Gaskets with Asbestos-Teflon base. They have high mechanical strength and heat resistance, with excellent sealability at low bolt stresses.

J-M Chempac Folded Gaskets designed for glass lined equipment. Asbestos-Teflon base gives them high sealing effectiveness against a wide range of chemicals.

J-M Chempac Spirotallic Flange Gaskets for perfect sealing in high temperature and pressure service, constructed of interlocked plies of metal and Teflon-Asbestos.

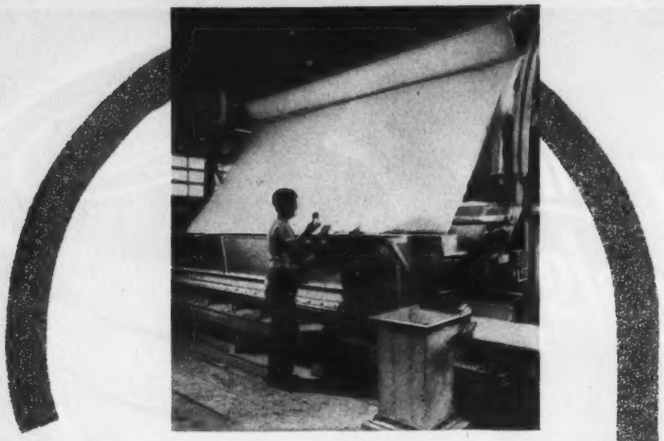
*Trade Mark of DuPont Tetrafluoroethylene resin

Free Folder gives complete details on Chempac-Interlocked and other J-M Chempac Packings and Gaskets for the chemical and process industries. For your copy of folder PK-80A write Johns-Manville, Box 60, New York 16, N. Y. In Canada, 199 Bay Street, Toronto 1, Ontario.

JOHNS-MANVILLE JM PRODUCTS

Johns-Manville PACKINGS & GASKETS

When inquiring check CP 5322 opposite last page



NOW 3 GREAT FEinc FILTERS FOR *REALLY* CONTINUOUS FILTRATION

Easy or tough, your continuous filtration is *different*. It takes a lot of experience plus careful study of your specific problem to select and design the smoothest running, most economical filter. Filtration Engineers Inc. offers you more than 35 years of this kind of experience . . . backed by proved ability to deliver tailor-made filters at no more than standard costs.

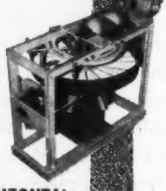
The FEinc String Discharge Filter . . . the original string filter . . . handles all types of cakes . . . even thin soupy slimes. The strings lift the cake from the cloth cleanly, and eliminate common problems of smearing, blinding and blow-back. Cloths last longer, with less down-time for washing or replacements. Often it's the most economical filter for easy jobs as well as tough ones. Special features included submergence washing and compression dewatering.

The new FEinc horizontal filter, simple, trouble-free, is recommended for free-filtering materials such as coarse granules, or fibrous cakes. Countercurrent washing is available.

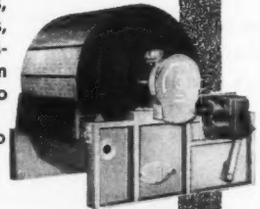
FEinc scraper filters, for standard problems, are quality built, with many special constructions, such as rubber covering, totally enclosed housings, etc. On filter at right, for instance, drum submergence can be varied at will from zero to 30%.

Ask today for full details or analyses . . . no obligation, of course.

STRING FILTERS



HORIZONTAL FILTERS



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CUSTOM DESIGNERS AND MANUFACTURERS OF ALL TYPES OF CONTINUOUS FILTRATION EQUIPMENT

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FEinc

43

When inquiring check CP 5323 opposite last page

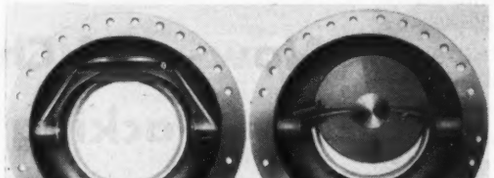
Seat and valve clean each other with each operation of valve made of aluminum . . .

unit is treated to prevent galling and wearing at metal-to-metal contact points

Uses: On blenders, pipeline feeders, and similar equipment.

Features: Valve has shear opening and closing mechanism. By design, seat and valve clean each other with each operation, providing a clear, straight-through passage for maximum flow of material.

Description: Self-cleaning, dust-tight valve is made of aluminum, specially treated to prevent galling and wearing at metal-to-metal contact. Material of construction gives valve light weight and resistance to chemical corrosion. Unit can be substituted in most operations requiring stainless steel and more expensive metals. Temperatures to 600°F can be handled by the valve.



Valve is light in weight and corrosion-resistant

Units are machined to close tolerances for accurate seating without use of shims. In addition to specially-treated aluminum, they are made from non-ferrous metals, Monel, stainless and carbon steels. Sizes range from 3 to 20".

(Self-cleaning valve is a product of General Machine Company of N.J., Dept. CP, 386 Market St., Newark, N. J.. . . . or for more information check CP 5324 on handy form opposite last page.)

Higher variable feed demand met by pumps offering feed pressures to 1000 psi . . .

accuracy maintained over wide pressure range

Uses: On machines and processes employing automatic or semi-automatic repetitive motion sequences.

Features: Packaged units meet demands for higher variable feeds which will remain accurate over a wide pressure range. Adjustable, pre-selected fine and coarse feeds delivered by pump are automatically maintained irrespective of changes in in-

Threaded Specialties

lower cost TEE BOLTS by an exclusive method

Among Pawtucket's many specialty products are these lower-cost tee-head bolts. Pawtucket's exclusive production method keeps cost low, dimensional accuracy unusually high and strength above standard.
Pawtucket tee head bolts are made in standard sizes ¼" and larger, or to your specifications. In any size, you can depend on a uniform Class 3 fit, if required.

All standard steels, stainless steels and non-ferrous metals, including Titanium

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PAWTUCKET MANUFACTURING COMPANY

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THE PLACE TO SOLVE YOUR BOLT PROBLEMS

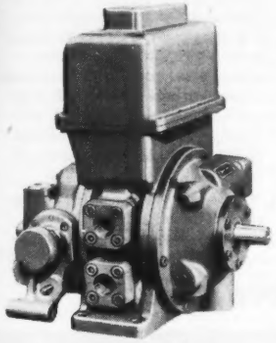
T.M. REG. "The Bolt Man"

When inquiring check CP 5325 opposite last page

ternal leakage due to changes in working pressure. Maximum feeding pressure is 1000 psi.

Two sizes of built-in gear pumps for rapid traverse purposes are available. Maximum traverse pressure is 300 psi.

Description: On these variable-feed pumps, designated JK-10602 and JK-10604, dual, direct solenoid actuated, built-in control valves provide quick and positive control functions in response to remote pushbutton or limit switch control. Full, automatic protection against damage to machine, work, or tools is provided in case of power failure.



Pre-selected feeds delivered by pump are automatically maintained

Small switch and control panels, standard for smaller pumps, operate these units. Only two pipes or flexible tubes are required to complete fluid power system of a pump and double-acting cylinder. Inspection, adjustment, and servicing of practically all parts can be performed without removing pump, disconnecting piping, or draining system.

(Variable-speed pumps are products of The Oilgear Company, Dept. CP, 1560 West Pierce St., Milwaukee 4, Wisconsin . . . or for more information check CP 5326 opposite last page.)

You help us decide what articles appear in CP . . .

Yes, you help to determine just what our editorial pages will contain from month to month. Every article appearing in CHEMICAL PROCESSING must first be "qualified" — that is, judged for its importance and idea value to our readers. In qualifying material, we rely heavily on reader response to related developments gathered in the field and published in the past.

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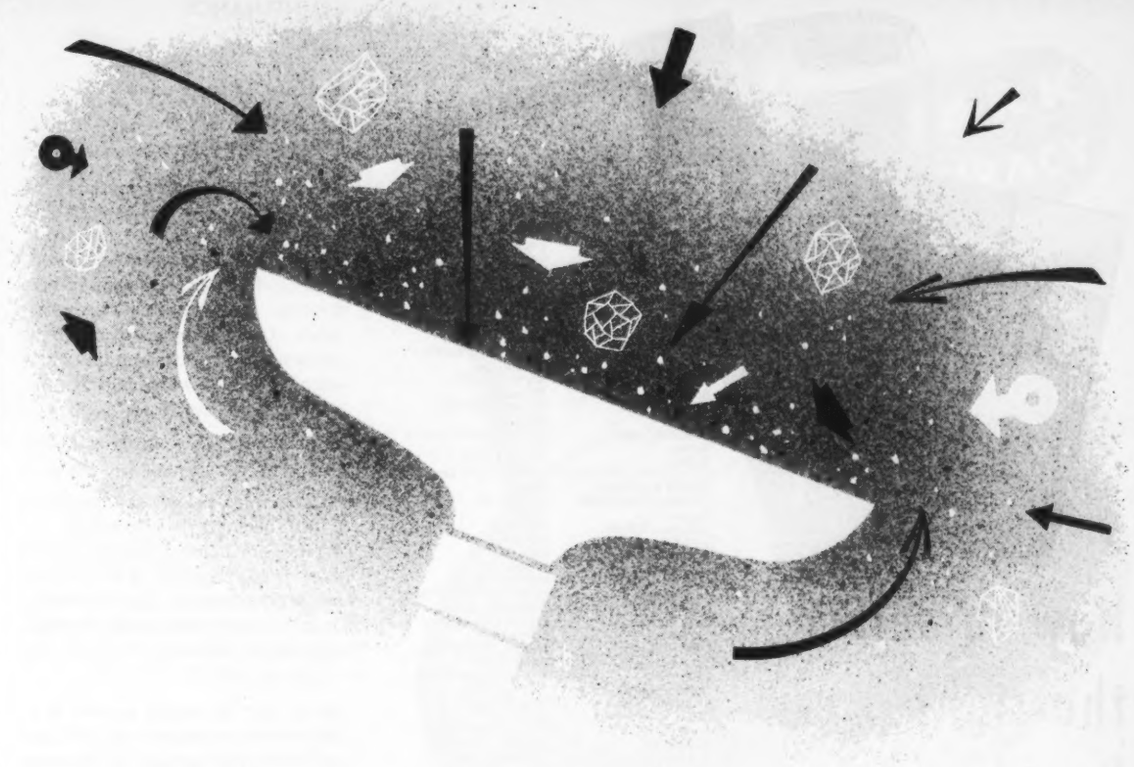
THE EDITORS



remove ... and control those chemical dusts with HOFFMAN INDUSTRIAL VACUUM CLEANING

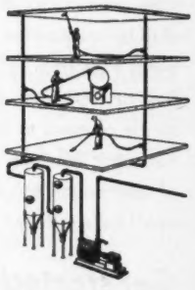
For effective sanitation—and salvage if need be—of dry chemical materials on the loose, you'll find the ideal answer in Hoffman Heavy Duty Vacuum Cleaning.

The powerful suction of the Hoffman system is the perfect supplement to regular ventilating-collecting installations for 100% effective control of dust and dry material.

And the flexibility of the vacuum cleaning is invaluable when there is need for picking up granular, powdered, or dusty materials from locations out of the ordinary. The ease with which a hose and nozzle can be run from a nearby outlet in permanent systems—or a portable vacuum cleaner—for quick, thorough removal, can be especially important when the material has a high cost, nuisance, or danger factor. Recovery of salvageable material is always simple, since all of it is collected in a central receptacle for later disposal.

These *additional* functions of Hoffman Industrial Vacuum Systems—above and beyond the basic job of keeping premises dry-scoured of dust and dirt, from floor to ceiling, are attracting the interest of alert engineers concerned with maintenance, safety, and materials handling.

Let Hoffman engineers show you the versatility and effectiveness of the Hoffman Industrial Vacuum System in handling dry materials. The coupon will bring you full information in a hurry.



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Please send me at once the Hoffman Industrial Vacuum Cleaning Booklet.

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When inquiring check CP 5327 opposite last page

How to select the right liquid meters

. . . to save time and ingredients, with closer quality control, and more accurate cost accounting. That's the subject of this helpful free bulletin. It covers meters for measuring hot and cold water, oils, syrups, brines, soap solutions, and many other chemical solutions that can be handled by composition bronze meters. Illustrates sizes from ½" to 6", with rates of flow to 1000 gpm. Registers range from simple counters to the newest Auto-Stop automatic batching meters. A gold mine of information for any processing engineer. Bulletin 566U P.

Acetate, Amyl
Acetate, Butyl
Acetate, Ethyl
Acetate, Lead
Acetone
Alcohol, Amyl
Alcohol, Ethyl
Alcohol, Methyl
Ammonium Nitrate Solution
Ammonium Sulfate Solution
Asphalt, Liquid
Banana Oil
Barium Chloride
Benzol
Boiled Oil
Borax Solution
Brine
Bronzing Liquid
Bunker "C"
Butanol
Calcium Chloride Brine
Carbon Bisulphide
Carbon Tetrachloride
Castor Oil
Cellulose Solvent
China Wood Oil
Chloropicrin
Chocolate
Cleaner, Asphalt Tile
Cocoa Butter
Coconut Oil
Code Rubber Oil
Coffee
Condensate
Corn Molasses
Corn Syrup
Cotton Seed Oil
Crude Oil
DDT
Dextrine Solution
Diacetone
Dibutyl Phthalate
Diethyl Carbitol
Diethylene Glycol
Diethyl Hexyl Phthalate
Dimethyl Phthalate
Dioctyl Phthalate
Dope (Nitrocellulose)
Esther Gum Oil, Drying
Ethyl Cellosolve
Ethylene Glycol
Fish Oil
Formaldehyde
Freon
Fuel Oil, Hot
Glucose
Glue, Water Solution
Glycerine
Grease
Ink, Oil Vehicle
Ink, Water Vehicle
Isobutylene
Isopropanol (Isopropyl Alcohol)
Kerosene
Lacquer
Lime Water
Linseed Oil
Liquid Soap
Liquid Sugar
Lubricating Oil, Hot
Lubricating Oil
Mesityl Oxide
Methylated Spirits
Methyl Bromide
Methyl Cellosolve
Methyl Formate
Methylene Chloride
Mineral Oil
Mineral Spirits
Molasses
Monochlorbenzoil
Naphtha
Nitrocellulose Lacquer
Oleic Acid
Oleum Spirits
Orthodichloro Benzine
Paint
Paraffin Oil
Paste
Perfume
Petrolatum
Pine Oil
Plasticizer
Polymer, Molten
Potassium Carbonate
Propylene Glycol
Pyrethrum Mixtures
Rum
Shellac, Alcohol Sol.
Silicone Oil
Silicon Tetrachloride
Size Solution
Soap Solution
Sodium Benzoate
Sodium Carbonate
Sodium Chloride
Sodium Silicate
Soy Bean Oil
Starch Solution
Stearic Acid
Stoddard Solvent
Styrene Monomer
Sugar Syrups
Tallow
Tannic Acid
Tire Compound
Trichlorethylene
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Whiskey
Wine
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neptune liquid METERS

When inquiring check CP 5328 opposite last page

Variety of uses seen for subminiature thermal switch . . .

at critical temp, resistance of unit drops to less than .10 ohm

Uses: As a switch for controlling chemical processes and heat treating; to take positive action when a specified temperature is reached; to provide an advisory or warning signal when critical temperatures are reached.

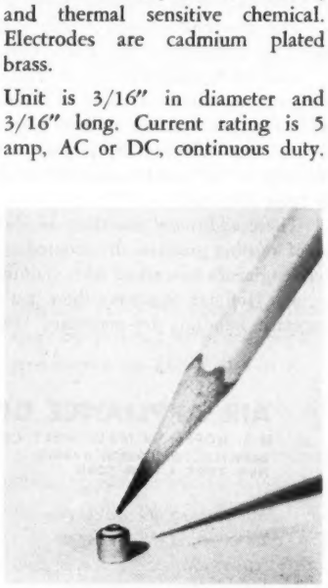
A variety of other uses is seen for this subminiature unit.

Features: Below a predetermined switching temperature, resistance of chemical thermal switch exceeds 10 megohms. When switching temperature is reached, resistance becomes permanently less than 0.10 ohms. Accuracy of unit is plus or minus 2%.

Small mass of switch permits it to follow temperatures rising at a rate of 100°F per second. It operates under extreme vibration or shock. Very low temperatures do not alter operating point.

Description: Subminiature thermal switch, called the MiniTherm, is in the form of a small cartridge which is easily replaced. It has only four parts — an external electrode, ceramic insulator, center electrode, and thermal sensitive chemical. Electrodes are cadmium plated brass.

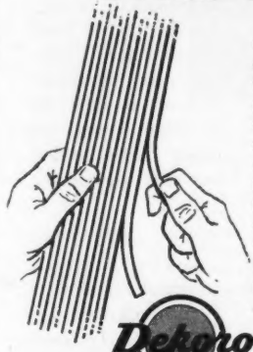
Unit is 3/16" in diameter and 3/16" long. Current rating is 5 amp, AC or DC, continuous duty.



Switch operates under extreme vibration or shock

DEKORON RIBBON

individually sheathed instrument tubes that install in a fraction of the usual time



Dekoron Ribbon is a new concept in multiple tube instrument line—a strip of 10 copper, aluminum, or "P" (polyethylene) tubes each individually coated with vinyl plastic. A thin "web" of vinyl attaches adjacent tubes together . . . yet is perforated so that one or more tubes can be stripped from the ribbon without tools. Thus, each individual tube is protected from corrosion by its covering while in the ribbon as well as after being peeled from the ribbon. "P" tube Dekoron Ribbon is color coded for line identification. Lengths to 500 feet. Request free literature on Dekoron Ribbon. AA-749

Dekoron products

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When inquiring check CP 5329 opposite last page

in just 3 seconds

. . . you can read any surface temperature in your plant . . . accurately and easily . . . with the Alnor Portable Pyrocon.

Compact in size, complete in precision design and workmanship, this rugged instrument assures the highest standards of speed, accuracy and dependability. You can take temperature readings on materials in process, the finished product or the heated equipment itself—in as few as 3 seconds!

Alnor Portable Pyrocons come in scale ranges to 2000° F., with thermocouples for every application. You'll find full details on the Pyrocon exactly suited to your operations in Bulletin 4257. Send for your copy now. Write: Illinois Testing Laboratories, Inc., Room 504, 420 N. LaSalle St., Chicago 10, Ill.

Alnor PRECISION INSTRUMENTS FOR EVERY INDUSTRY

When inquiring check CP 5330 opposite last page

RECONSTRUCTION FINANCE CORPORATION SEALED BID SALE

Invitation to Bid for Mineral Rights and Real Estate

Approximately 17,400 acres of mineral rights in Edmonson, Grayson, Hardin and Breckinridge Counties, Kentucky; also 459 acres, more or less, of farm land in Edmonson County, Kentucky.

Reconstruction Finance Corporation invites bids for the purchase of mineral rights and real estate formerly owned by Ohio Valley Rock Asphalt Company referred to above. The mineral rights are under land located in the asphalt producing region of Kentucky and include coal, crude petroleum, oil, gas, limestone, standstone, asphalt and any and all other materials of any kind and character except uranium, thorium and materials essential to the production of fissionable material. The 459 acre farm tract is located on State Highway 67, approximately six (6) miles from Brownsville, Kentucky, which is 100 miles south of Louisville.

Anyone interested in the purchase of the property and mineral right may obtain bidding forms and a statement of terms and conditions relating thereto at the Chicago office of RFC, Room 221 — 105 West Adams Street, Chicago 3, Illinois. Telephone — State 2-0800.

Bids for the property will be considered only if made in accordance with and subject to the terms and conditions set forth in said statement. All bids must be presented at the aforesaid Chicago Office of RFC by 2:00 P.M. (C.S.T.) on February 24, 1955.

When inquiring check CP 5331 opposite last page

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...engineering time and assure uniform top quality when you select standard Micro-Blanks from our new 12-page catalog. There is a Micro-Blank to fit nearly every requirement.

M. N. AITKEN CO.

5960 KANSAS ST. HOUSTON 7, TEXAS
Telephone Victor 4491

When inquiring check CP 5332 opposite last page

Switches are available at switching temperatures from 150° to 400°F in increments of 25°F, from 400° to 1000°F in increments of 50°F.

(Subminiature thermal switch is a product of MiniTec, Dept. CP, 5423 Delaware Ave., Los Angeles 41, Calif. Check CP 5333 on handy form opposite last page.)

No crack, chip, or peel when rubber coating is on masonry

Uses: As a finish for surfaces such as concrete, brick, hot plaster, and other masonry.

Features: Rubber base of coating is chemically inert to high alkalinity of various kinds of masonry, and will not crack, chip, or peel.

Although coating is highly water resistant it does not prevent masonry surfaces from breathing, thereby allowing any trapped moisture to be released.

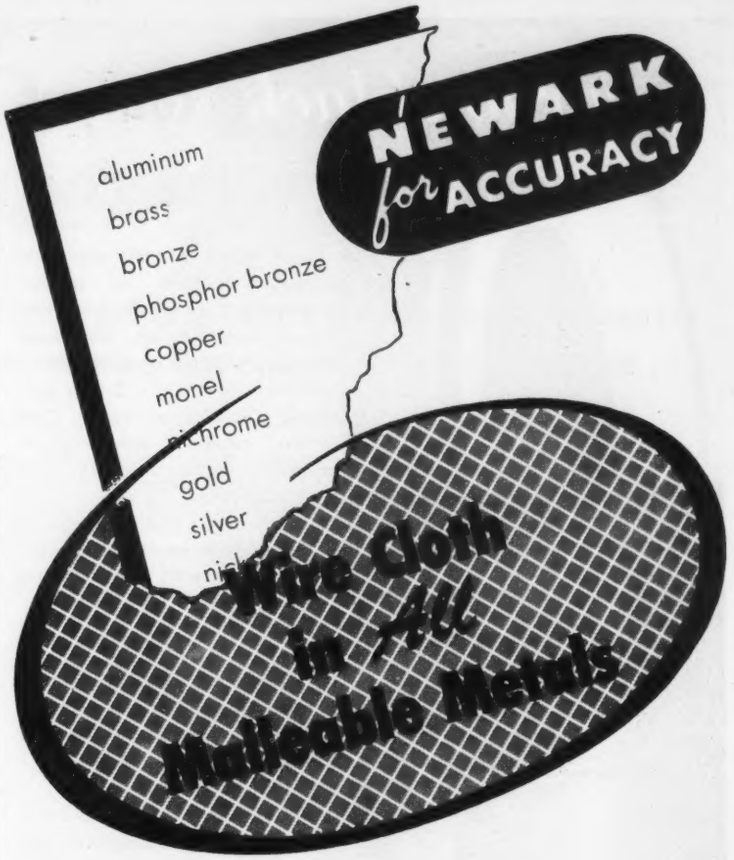
Description: Synthetic rubber-based masonry coating, called Pliotone, is non-oxidizing, mildew resistant, and dries rapidly to a smooth, long-lasting finish that will not yellow with age. It is easily applied by brush or spray. Coating is available in nine colors.

(Rubber-based masonry coating is a product of Preco Chemical Corporation, Dept. CP, 84 County Court House Road, New Hyde Park, N. Y. Check CP 5334 on handy form opposite last page.)

Multi-V-belt drive information

Convenient guide to design of standard and high-capacity drives is featured in 76-page, illustrated multi-V-belt engineering handbook.

"Multi-V-belts, Engineering Handbook" is issued on letterhead request to Industrial Products Div., B. F. Goodrich Co., Dept. CP, 448 Main St., Akron 16, Ohio.



Newark Wire Cloth is made of *all* malleable metals such as aluminum, brass, bronze, phosphor bronze, copper, monel, Nichrome, nickel and stainless steel; as well as the noble metals such as gold, silver, platinum, etc.

This wide range of metals enables you to select the one wire cloth to meet your conditions of corrosion and/or contamination.

In all metals, Newark Wire Cloth is accurately woven in a wide range of meshes, ranging from very coarse (4 inch space cloth), to extremely fine (up to 400 mesh). Our reputation for 'Accuracy' through more than 75 years is your guarantee of wire cloth quality.

We maintain a large stock of popular sizes in the more commonly used metals and can make prompt shipment. Let us quote on your requirements.

Send for our New Catalog E.

Newark Wire Cloth COMPANY

351 VERONA AVENUE • NEWARK 4, NEW JERSEY

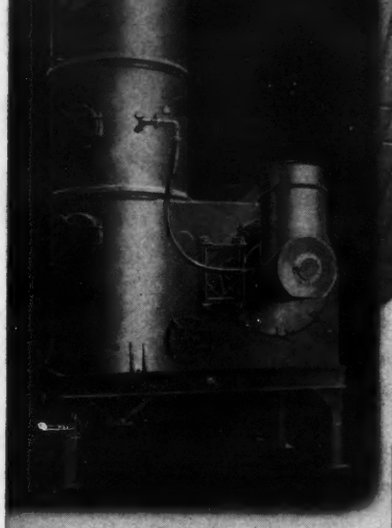
When inquiring check CP 5335 opposite last page

carbon black can put you[r] [pl]ant in the *red*

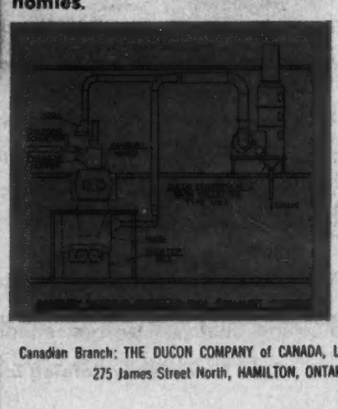
Whether you manufacture automobile tires or rubber grommets . . . for that matter, if you work with any substance which produces a particularly stubborn dust . . . Ducon Dynamic Centrifugal Wash Collectors provide the highest efficiency obtainable in wet type collectors.

You can effectively control problem dusts *and* reclaim valuable fines with the DUCON UW-3 "package unit", combining exhauster and precipitator. Employing two-phased washing, it has successfully handled such difficult dusts as carbon black, pigments and other extremely fine dusts . . . at better than 99% efficiency.

Unit construction of this Ducon Collector simplifies installation and maintenance with almost any type of exhaust system. Prove to yourself that proper dust control can make a difference in production economies.



Complete assembly of the Type UW-3 Ducon Centrifugal Wash Collector.



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the name in dust control

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CYCLONES • CENTRIFUGAL WASH COLLECTORS • TUBULAR CLOTH FILTERS • DUST VALVES

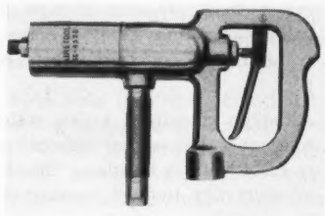
When inquiring check CP 5336 opposite last page

Condenser tube cleaner weighs only 11 pounds, is one-man operated

Uses: Cleaning completely plugged tubes up to 1" I.D. and smaller.

Features: Unit weighs only 11 lb and can be used by one operator. It operates at high speed and cleans fast. Muffler attachment reduces exhaust noise to a minimum.

Description: Lightweight condenser tube cleaner, designated No. CC-4325, has built-in flushing system with quick shut-off valve for water feed. It is equipped with either a regular handle or a sleeve valve handle for controlling flushing agent which also cools drill. Air supply valve has trigger to start and stop piston and to regulate speed. Valve automatically shuts off when trigger is released.



Muffler on cleaner reduces exhaust noise to minimum

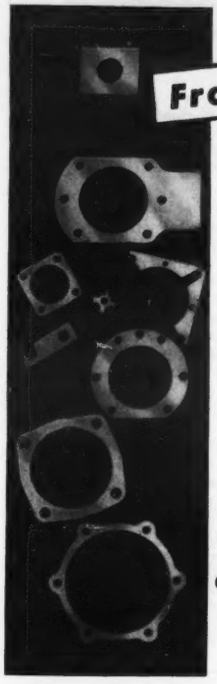
(Condenser tube cleaner is a product of The Airetool Mfg. Co., Dept. CP, 304 S. Center St., Springfield, Ohio . . . check CP 5337 on handy form opposite last page.)

Low-cost siding of aluminum

Aluminum product, designed to achieve more attractive, low-cost siding on industrial buildings, is described and pictured in fact file. Typical construction details on the ribbed siding are included.

File Series 300-1 is available from Aluminum Company of America, Dept. CP, 1501 Alcoa Bldg., Pittsburgh 19, Pa. When inquiring specify CP 5338 on handy form opposite last page.

GASKETS·SHIMS WASHERS



From 1 to 1 Million

No matter what type, thickness, shape or quantity required, you can count on Chicago-Wilcox for uniformly accurate gaskets, shims, washers or special stampings.

With 50 years accumulation of dies, chances are we can furnish just what you need without a die charge—thus reducing costs substantially and assuring on-schedule delivery.

Gaskets, shims and washers can be supplied in metallic, non-metallic and plastics . . . teflon, nylon, etc. . . . and in quantities to meet your production requirements.

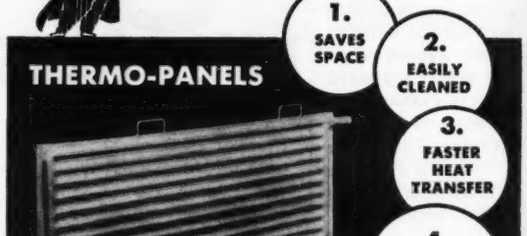
Write for catalog and submit your specifications for quotation.

CHICAGO-WILCOX MFG. CO.

7701 South Avalon, Chicago 19, Illinois

When inquiring check CP 5339 opposite last page

4 ways better than PIPE COILS



Scientifically designed heat exchangers for which performance can be accurately anticipated . . . for use in the heating or cooling of liquids, slurries, soaps, waxes, acids, alkalis, electrolytes, powders, and mixtures.

Available in special shapes such as "U"s, "L"s, and cylinders . . . and in a wide range of materials, including iron, stainless steel, monel and other special alloys.

Send for FREE bulletin giving facts and prices.

THERMO-PANEL DIVISION Dept. CP-255

DEAN PRODUCTS, INC. • 616 Franklin Ave., Brooklyn 38, N. Y. STerling 9-5400

Manufacturers Representatives Wanted • Choice territories now open • Write for details

When inquiring check CP 5340 opposite last page

All-metallic valve construction eliminates use of packings, insures positive seal . . .

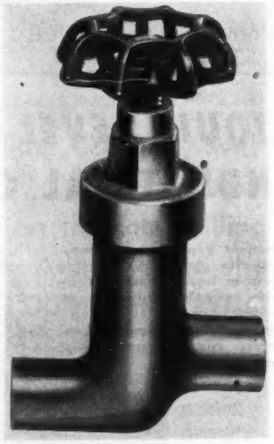
bellows unit is designed in hand-operated or pneumatic-hydraulic models

Uses: Suitable for high vacuum systems such as laboratory equipment, exhaust systems for hermetically sealed products such as electronic equipment, mass spectrometers, and similar service. Pneumatic-hydraulic model is well suited for multiple manifold setups and remotely operated valves.

Features: All-metallic construction of valve eliminates use of sliding or restrictive packings and insures a positive leak-tight seal. Wear and deterioration are minimized.

Description: Bellows-type packless valve is designed in hand-operated or pneumatic-hydraulic models. Hand-operated valve has a ball joint construction in handle which prevents torque from being transmitted to bellows and valve stem. Valve is seated by a straight vertical thrust with no rotating motion.

Standard models are conservatively rated for pressures up to 150 psi and with minor modifications can be adapted for much higher pressures. Units are also recommended for temperature service from −65° to 250°F in standard models, with greater extremes possible with small modifications. Bellows of corrosion-resistant metals such as stainless steel and Monel can be furnished. Inlet and outlet fittings are ⅛" female pipe tap on both valves, as is the actuating pressure line connection on pneumatic-hydraulic valve.



Design of valve minimizes wear and deterioration

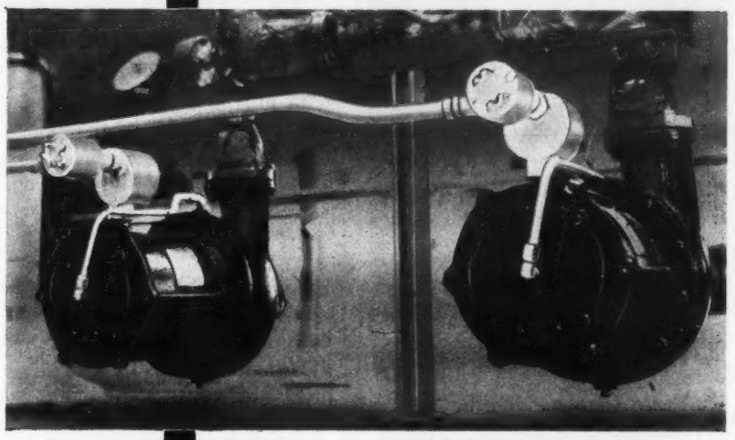
(Packless valves are products of Clifford Manufacturing Company, Dept. CP, 152 Grove Street, Waltham 54, Mass. . . . or for more information check CP 5341 on handy Reader Service slip located opposite last page.)

Freon 11 volume-temperature-pressure nomograph on page 210

Chempump

handles problem fluids without failure or leakage of any kind...

at large midwestern chemical plant



Two 2-hp. *Chempumps* on 0°F service, handling liquid which tends to polymerize on contact with air . . . thereby forming hard crystals which could cause operational trouble with ordinary pumps.

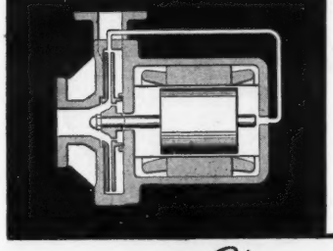
PROOF through *performance* is what sold this big chemical company on seal-less, leak-proof *Chempump.*

In one particular process, one man was kept busy just maintaining seals on small centrifugal pumps. When the *Chempump* was introduced, problem fluids were handled without failure or leakage of any kind. So far, maintenance has been no problem. The service these seal-less pumps have given is felt to more than justify the higher initial equipment outlay.

This is just another example of how *Chempump* has licked tough leakage problems! With this seal-less combined motor and pump unit, normally hard-to-handle fluids can't leak or become contaminated. Periodic inspection to indicate necessity of simple bearing change is the only maintenance required.

Your process can benefit through *Chempump*, too. For details, send for new 16-page Bulletin 1010. Chempump Corp., 1300 E. Mermaid Lane, Phila. 18, Pa.

Engineering representatives in over 30 principal cities in the United States and Canada.



Chempump combines pump and motor in a single hermetic unit. Pumped fluid enters rotor chamber; no shaft sealing device required.

Approved by Underwriters' Laboratories. Available in wide choice of materials . . . from ⅓ to 7½ hp. Capacities to 250 gpm. Heads to 195 feet.

Chempump can't leak!

Chempump—
first in the field . . . process-proved

Please send me details on *Chempump* for:

_____
(application)

*Capacity*_____ *Total dynamic head*_____

*Name*_____

*Title*_____

*Company*_____

*Address*_____

*City*_____ *Zone*_____ *State*_____

When inquiring check CP 5342 opposite last page

plant-location news

Need facts on buildings or sites?

Here's some plain talk on a rather tricky subject—industrial real estate. Our Industrial Location Service doesn't sell property, but we can help you with many of the problems involved in locating the right plant, or plant site, for your company. What we do is supply confidential data to suit your needs on available sites or buildings anywhere in New York State. This comprehensive information is free of charge and, even more important, it's free of "boosterism"!

We never try to unload real estate just because it's available. Businessmen simply don't go for that kind of promotion. Besides, the aim of New York State's ILS is to find only the *best* locations for industry. We want companies who'll stay here for years to come. They'll do that only if the location *is* the best. That's why we supply unbiased data right from the beginning.

We aim to please: with facts

That's the kind of thinking behind the ILS information service. The way we look at it, real property is only one of many considerations. ILS experts never recommend a site without sifting and analyzing all location factors in the light of your particular requirements. And they'll never withhold unfavorable information.

Find what you want here

Let's get down to cases, and see what kind of detailed information ILS offers on buildings and sites:

For suitable buildings, we'll give information on price and financing, describe the type and condition of the structure and explain the heating or cooling systems. You'll also learn about electric installations, sprinklers, floor-load capacities, and facilities for handling sewage and other waste. Water sources, rail sidings, loading docks—any detail you wish, plus photos and plans, can be supplied in these reports. The same data is available for sites.

If no suitable building exists, we'll help you arrange to have one built to your specifications. At the same time we'll help you secure financing at an annual cost you can afford.

You'll like the way we collect this information. It's put together without diyulging your indentity, so there's never the danger of prices being jacked up before you're ready to make a final choice.

Other free plant-site services

Buildings or sites won't be your only concern when you're looking for a new plant location. But no matter what factors are involved, ILS can be of help. Free reports are available on transportation, markets, raw materials, labor, water, and local laws and regulations—to mention just a few.

Our booklet called "Industrial Location Services" shows how you can put this valuable plant-location data to work. To get your free copy, just drop me a card, care of the New York State Department of Commerce, Room 862, 112 State Street, Albany 7, New York.

Ronald B. Peterson

Director, Industrial Location Service

When inquiring check CP 5343 opposite last page

MAINTENANCE

Deals with application of electric power

Application of electric power apparatus in the chemical industry is feature of lead article in publication. Emphasis is on enclosures recommended for protection against hazardous conditions. Other articles in 28-page booklet include a handy selection index for large motor protective enclosures, and a discussion on how silicone is being used in insulating materials and in metal coatings for atmospheric protection.

Synchronizer No. 41 is issued by Electric Machinery Mfg. Co., Dept. CP, 800 Central Ave., Minneapolis 13, Minn. When inquiring specify CP 5344 on handy form opposite last page.

Compact lube system designed for small machines . . .

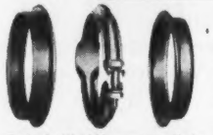
eliminates "oil-can" lubing

Uses: Automatic lubrication of machines having minimum lubrication demands.

Features: Unit makes possible elimination of "oil-can" methods in lubricating many small or delicate mechanisms.

Smaller than a cigaret pack, system contains reservoir, filter, pump, and meter units.

Contains all elements of complete lube system



To Apply: Weld Marman supplied flanges to tube ends and attach by means of Marman coupling.

Reference:
J-41—stainless steel—Food
J-61—stainless steel—Ind.
J-62—cold rolled steel—Auto.

'...made of **stainless steel or cold rolled steel** for 1" to 5" o.d. tubing. Model J-41, with a variety of special gaskets, is for use with stainless steel tubing in the food and chemical industries. Models J-61 and J-62 are for applications such as the coupling of exhaust manifolds and exhaust piping joints.

Economy, ease of application and speedy disconnect give this joint wide utility in chemical, oil, automotive, marine and many other industries.

Write, wire or phone Dept. CP-255

THERE IS A MARMAN CLAMP OR COUPLING AT EVERY GOOD JOINT

MARMAN PRODUCTS CO., Inc.
11214 EXPOSITION BLVD.
LOS ANGELES 64, CALIF.

7-437

When inquiring check CP 5345 opposite last page

LIQUID LEVEL and INDUSTRIAL CONTROLS

Positive! Dependable! Economical! No floats! No moving parts in liquid. Unaffected by acids, caustics, pressures or temperatures.
Induction relays, magnetic contactors and starters. Special control panels.

WRITE FOR COMPLETE CATALOG

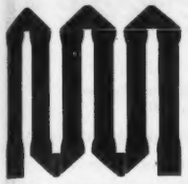
B/W CONTROLLER CORPORATION
2204 E. MAPLE ROAD BIRMINGHAM, MICH

FIRST IN THE FLOATLESS CONTROL FIELD

When inquiring check CP 5346 opposite last page

PACKAGED HEAT FOR FORCED AIR INSTALLATIONS

...TRENT "FOLDED-and-FORMED" HEATING UNIT PLUG



Here, in one compact "package" is a complete unit for efficient, high temperature controlled heating of forced air recirculating systems in annealing and tempering furnaces, heating ducts, baking and drying ovens. Multiple banks of Trent 'Folded-and-Formed" heating element racks are assembled, wired and mounted in a self contained insulated plug, complete with terminal control box. The unique construction of Trent "Folded-and-Formed" exposed ribbon type resistor elements assures maximum high temperature heat transfer... greater radiating surface per square inch of element cross section than any other type of electrical heating element.

TRENT "FOLDED-and-FORMED" HEATING UNIT PLUGS ARE GUARANTEED FOR FIVE YEARS!

TRENT FFP TYPE HEATING UNIT PLUG GIVES YOU

- Maximum Frame Temperatures to 1500°F.
- Velocities up to 2000 Ft./Min.
- More Wattage per Cubic Foot
- Watt Densities from 10 to 30 Watts per Sq. Inch
- Higher Temperature Operation
- 120, 240, 480 or 600V—3 Phase or Single Phase

These features add up to quicker heating and faster cooling, longer element and unit life . . . better controlled heat at lower cost.

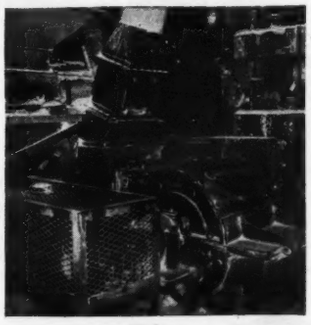
Let our experienced Trent Heating Engineers analyze your requirements and recommend the best installation for your operations . . . or ask to see the new Trent "Folded-and-Formed" Heating Element booklet.

TREN INC.
Electrically Heated Industrial Equipment
247 LEVERINGTON AVE., PHILA. 27, PA.

When inquiring check CP 5347 opposite last page

MANUFACTURERS OF PROCESSING MACHINERY SINCE 1885

Well known Milling Company with SIX Gruendler 75 H. P. Super Master Grinders on the job, milling super product for Adhesives to the tune of over–100,000 pounds daily!



One of SIX No. 5 Master-Grinders at the Huron Milling Company, Harbor Beach, Mich.

Send in a small quantity of your material for Free Test Run and Report by the Gruendler Laboratory.

WRITE FOR INFORMATIONAL BULLETINS
about, — PULVERIZERS — MIXERS — BLENDERS

GRUENDLER
CRUSHER & PULVERIZER CO.
2915 North Market St. *Dept. CP2* St. Louis 6, Mo.

When inquiring check CP 5348 opposite last page

Description: Reservoir of lube system, which is designated the "L Special", holds 20 cc. Pump can be adjusted to discharge .6, .45, or .3 cc each time plunger is pulled.

Unit may be installed to discharge into passages drilled in machine and leading to lube points. Or it may discharge into tubing leading to these points.

Lubricator is of die-cast aluminum. A one-piece ⅝" diam window in front of reservoir acts as sight gage for oil level.

(Small lubricating system is a product of Bijur Lubricating Co., Dept. CP, 151 W. Passaic St., Rochelle Park, N. J. . . . or for more information check CP 5349 on handy form opposite last page.)

For medium-duty cleaning hydraulic jet unit does the job . . .

superheated water and detergent remove grease and soil

Uses: Removal of grease and soil deposits in medium-duty cleaning operations.

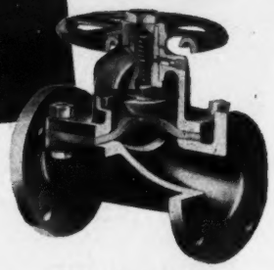
Features: Unit provides a solid jet of superheated water and detergent, propelled at high discharge pressure. Jet reaches even inaccessible machinery parts. If motors and equipment must be protected from water and excess moisture, unit provides pin-point cleaning under fingertip control of operator.

Description: Hydraulic jet cleaner, called the Speedylectric Hydrasteam 180, is available in both stationary and portable models. Source of steam is Speedylectric steam generator, free from flames and smoke, self-regulating, silent, and compact.

(Electric hydraulic jet cleaner is a product of Livingstone Engineering Co., Dept. CP, 100 Grove St., Worcester 5, Mass. . . . or for more information reader may simply check CP 5350 on the convenient Reader Service slip opposite last page.)

VALVE MAINTENANCE COSTS GETTING YOU DOWN?

The problem was solved in this plant with HILLS-McCANNA diaphragm valves



IF YOU HANDLE CORROSIVE FLUIDS THEY'LL DO THE SAME FOR YOU

The unique Saunders Patent design of Hills-McCanna Diaphragm Valves completely isolates the working parts of the valve from the flow. There is no packing to tighten or replace . . . no problem of leakage, internally or externally. You have a choice of body materials of any machinable alloy or linings of lead, glass, rubber, plastic, etc. Fifteen diaphragm materials are available including rubber, Neoprene and Teflon. There is also a wide choice of manual or remote operators. Sizes range from ⅜" through 14". May be used at pressures to 150 psi, temperatures to 350° F.

If you valve corrosive materials write today for descriptive folder. For specific recommendations send an outline of your requirements. HILLS-McCANNA CO., 2370 W. Nelson St., Chicago 18, Ill.

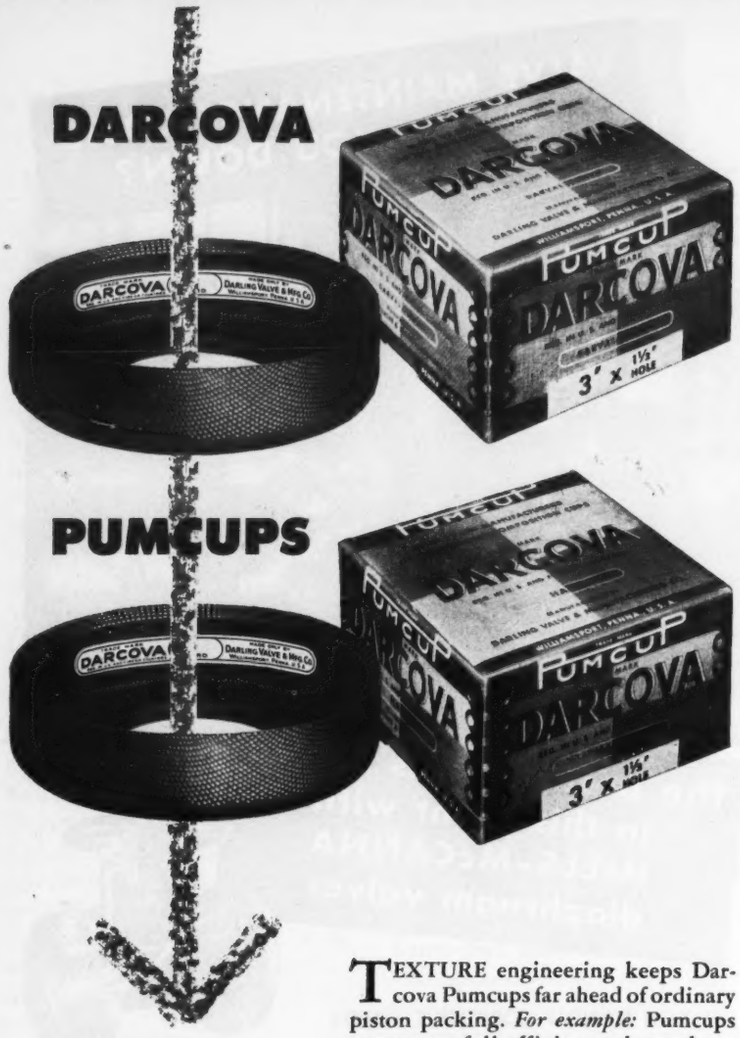
HILLS-McCANNA

saunders patent diaphragm valves

Also manufacturers of
Chemical Proportioning Pumps • Force-Feed Lubricators
Magnesium Alloy Sand Castings

V-11

When inquiring check CP 5351 opposite last page



...famous for

- PUMPING EFFICIENCY
- LOWER COST
- LONGER SERVICE

TEXTURE engineering keeps Darcova Pumcups far ahead of ordinary piston packing. *For example:* Pumcups operate at full efficiency throughout their entire life. Fluid slippage is virtually eliminated.

Moreover, you can count on much longer service . . . users report Darcova Pumcups outlast other packing at least 3 to 1!

Write for all the facts on Darcova efficiency: Bulletin No. 4502 on Pumcups for air and hydraulic mechanisms; No. 4401 on Pumcups for reciprocating pumps.

DARLING VALVE & MANUFACTURING CO.
Williamsport 4, Pa.

DARCOVA
THE ORIGINAL COMPOSITION CUP
PUMCUPS

When inquiring check CP 5352 opposite last page

Controlled, safe delivery of hazardous liquids

Uses: Dispensing aqua ammonia, liquid nitrogen and acetic acid, and other chemicals that do not effect and are unaffected by aluminum or stainless steel.

Features: Sensitive valving mechanism of nozzle insures a well-controlled, fast, safe delivery.

Description: Chemical dispensing nozzle, designated No. 2190, is constructed of aluminum alloy. This includes body, cap, tube, and disc holders. Lever pin, stem and main spring are of stainless steel. Disc material for both upper and lower discs is Teflon.

Nozzle handles petroleum as well as hazardous chemicals

Protective raised lugs on body of nozzle resist wear. Heel of guard has three-speed hold-open notches.

(Chemical dispensing nozzle is a product of OPW Corporation, Dept. CP, 2735 Colerain Ave., Cincinnati 25, Ohio. Check CP 5353 opposite last page.)

No "heat-treat" needed with aluminum alloy

High-strength aluminum alloy, which obtains physical properties by natural aging at room temperature, is described in 24-page data book.

Data book on 40-E aluminum is issued by Frontier Bronze Corp., Dept. CP, 4870 Packard Rd., Niagara Falls, N.Y. Specify CP 5354 opp. last page.

a manual
SHUT-OFF VALVE
that doesn't leak

- "O" Ring seal for dead tight shutoff
- 416 Stainless barstock body
- Liquid or gas service to 3000 psi
- Design permits throttling

Send for information today . . . . . ☐

OTHER CIRCLE SEAL VALVES
• Check Valves • Relief Valves • Shuttle Valves

CIRCLE SEAL *precision valves*
Representatives in Principal Cities.
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2181 East Foothill Boulevard, Pasadena 8, California

When inquiring check CP 5355 opposite last page

LIGHT
BUT SO STRONG!
~~TOTELINE~~ **FIBERGLASS TRAYS**

For Drying:
CHEMICALS
PHARMACEUTICALS
ANTIBIOTICS

They're feather-light, but they're durable and sturdy as any trays you've ever used! What's more, the large inside corner radii makes them very easy to clean. And, because fiberglass does not absorb heat, the materials dry faster in Toteline trays. Many sizes available. Write

TOTELINE Wherever materials are handled

MOLDED FIBERGLASS TRAY CO.
World's largest producer of Fiberglass reinforced resin Trays, Tote Boxes
LINESVILLE, PENNSYLVANIA

When inquiring check CP 5356 opposite last page

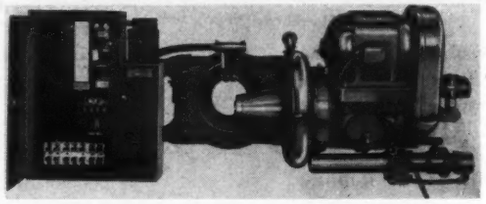
Automatic starting improved on burner unit which uses preheated No. 6 oil . . .

design also reduces noise caused by burning heavier oils at too-low temperatures

Uses: Burner unit is designed for use with preheated residual #6 fuel of viscosity between 45 and 300 SSF at 122°F.

Features: Unit has an equalizing valve built into fuel pump reservoir along with fuel volume, metering delivery control valve. Equalizing valve improves automatic starts on #6 oil, being especially effective in improving combustion at all firing rates where catalytic #6 oils have not been raised to temperatures required for complete combustion. It also reduces noise caused by burning heavier #6 oils at too-low temperatures.

Description: Horizontal rotary heavy oil burner unit, designated Model BHE, is completely factory wired and assembled compact, and ready for easy installation. Capacities range in 10 sizes from 15 to 175 gph. Unit is available with or without a panel box containing complete control assembly.



Ten burner sizes range in capacity from 15 to 175 gph

Because of equalizing valve, a low density electric heater may be used in place of a standard heater. This provides larger electric heating capacity so that, with a 20 psig spring loaded valve in line between heater and burner, temperature of oil to burner may be raised to that found best for burning. This combination also prevents oil vaporization at relatively high temperatures.

(Oil burner unit is a product of Preferred Utilities Manufacturing Corp., Dept. CP, 1860 Broadway, New York, N. Y. . . . or for more information check CP 5357 on handy form opposite last page.)

Ion exchange system detailed

Ion exchange system for purification of chromic acid copper stripping solution is presented in some detail in four-page bulletin.

Bul 224-B-454 is issued by Industrial Filter & Pump Mfg. Co., Dept. CP, 5900 Ogden Ave., Chicago 50, Ill. When inquiring specify 5358 opposite last page.

• Calcium chloride brine • Flushing liquor • Sodium sulphate • Asbestos fiber & cement mix • Green liquor • Soap solution • Grinder coolant • Carbon slurry • Cane wash • Salt brine • Sea water • Caustic solution • Bleach liquor • Grape juice concentrate • Tomato juice concentrate • Tomato puree • Propanol • Soap liquor • Cane juice • Aqueous lime • Coke oven oil • Paper stock • Waste sulphite liquor • Alkylaryl sulfonate • Sugar liquor • Vinyl pyridine • Saturated brine • Grape juice • Tomato juice • Press liquor • Calcium bisulphite • Melt Phenolized ammonia • Ammonia liquor • Sulphuric acid • Paraffine oil and water • Sludge • Milk waste • Gritty water • Cane syrup • Lime & soda solution • Cachaza • Clear juice Cement • Gasoline • Depanol White water • Mineral oil • Chromic acid Flume water • Brine • Vegetable oil • Licorice liquor • River water • Benzine thinner • Mash Methylene chloride • Sodium hydroxide Sizing solution • Alcohol • • Steep soda • Caustic soda Black liquor • Ethylene glycol • Fuel oil • Furfural • Condensate •

WRITE FOR BULLETIN 1125-B

DE LAVAL *Centrifugal Pumps*

DE LAVAL STEAM TURBINE COMPANY

889 Nottingham Way, Trenton 2, New Jersey

When inquiring check CP 5359 opposite last page

Increase your productivity and reduce overhead costs with smooth, *dependable* Roper Rotary Pumps. The two models illustrated (of the 3600 Series so widely used in virtually every industry) are naturals for transferring fats, oils, sirups, and similar products. Model MAHB is best suited for stationary equipment. Model HBRV is Roper's outstanding general purpose pump that lends itself to tank truck installations. The Roper principle of two moving parts — equal size gears — promotes high efficiency and holds maintenance problems to a minimum. Available in standard fitted, all iron and bronze fitted construction to suit your needs. Series 3600 pumps available in sizes 40-300 G.P.M. — pressures to 60 P.S.I.

ROPER
Rotary Pumps

GEO. D. ROPER CORPORATION
742 BLACKHAWK PARK AVE. ROCKFORD, ILL.

When inquiring check CP 5360 opposite last page

Traffic flow expedited, heating costs reduced by automatic door . . .

easy to install, unit leaves full width of existing door

Uses: In industrial plants where doors must be kept closed except to permit passage of lift or hand trucks, or other traffic.

Features: Automatic, electrically-operated doors enable lift trucks or other vehicles approaching to proceed through door without stopping, thus expediting traffic flow. Fast operating doors reduce to a minimum the loss of heat, air conditioning, or humidity occasioned by doors left open too long.

Description: Automatic industrial doors, called Prest-O-Matic, are furnished in completely packaged units consisting of doors, motor and operating mechanism, together with all the hardware and component parts. Units can be installed in about three hours on existing doorways. Automatic doors are so designed that complete width of existing doorway is retained.

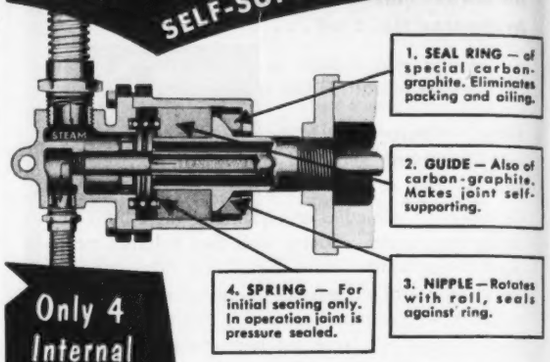
(Automatic doors are a product of Clark Door Co., Inc., Dept. CP, 515 Hunterdon St., Newark 8, N.J. Check CP 5361 opposite last page.)

Cost cutting suggestions for heat exchangers

How to design with finned heat exchanger tube to reduce costs is explained in 48-page brochure. Helpful charts and tables covering various design and calculation data on heat exchangers are also presented. Case histories of several installations of the finned tube are detailed.

"An Opportunity To Cut Costs . . ." is issued by Wolverine Tube, Div. of Calumet & Hecla, Inc., Dept. CP, 1850 Guardian Bldg., Detroit 26, Mich. Check CP 5362 opposite last page.

JOHNSON Rotary Pressure JOINT
SELF-SUPPORTING TYPE


1. SEAL RING — of special carbon-graphite. Eliminates packing and oiling.
2. GUIDE — Also of carbon-graphite. Makes joint self-supporting.
3. NIPPLE — Rotates with roll, seals against ring.
4. SPRING — For initial seating only. In operation joint is pressure sealed.
STEAM

Only 4 Internal Parts

For introducing steam and liquids into rotating rolls and cylinders, there's nothing like the Johnson Joint above. It's packless, self-lubricating, self-adjusting, self-supporting. It has been adopted by dozens of machinery makers, and is finding new uses every day.

Type SB shown handles both steam and condensate through same head; also available for through flow service, and in sizes and styles for all operating conditions. ***Write for literature.***

The Johnson Corporation
826 Wood St., Three Rivers, Mich.

When inquiring check CP 5363 opposite last page

AIR POLLUTION

Air pollution can be an expensive problem in two ways: High odor levels in work areas cuts production efficiency, and outside air pollution results in bad public relations or legal claims.

Activated Carbon will help eliminate both hazards. Activated Carbon is also being used in operations requiring completely pure and sterile air, such as food manufacture and biochemical processes.

When writing, please furnish as much information about your specific needs as possible.

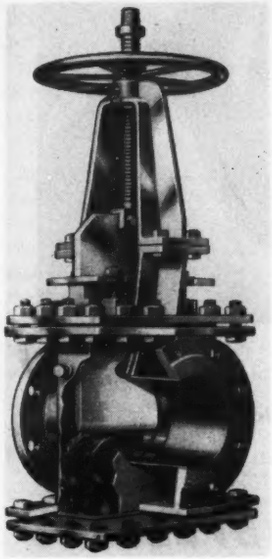
BARNEBEY-CHENEY Company
CASSADY AT EIGHTH / COLUMBUS 19, OHIO
In Canada: BARNEBEY-CHENEY LTD., St. Johns, Quebec

When inquiring check CP 5364 opposite last page

Rubber body seat may be replaced while valve is in line

Uses: Controlling flow of heavy solutions of paper stock.

Features: Stock valve has rubber seating which is easy to inspect or replace while valve is in line. Rubber or neoprene seats eliminate "lip" area, thus preventing build-up or deposits. Seats press tightly together when gate is open, insuring smooth flow of heavy solutions. Collection of stock fibers in chest area is kept to an absolute minimum.



Various materials of construction are available for valve body and trim

Rubber seats are installed with no clearance between, thereby eliminating passage of flowing medium into bonnet areas and allowing a minimum of pressure drop and turbulence to impede flow through valve.

Description: Working pressure of stock valve is 125 psi. Various constructions are available including: all stainless steel or other specified alloy; stainless steel or other specified alloy with mild steel exterior trim; US Corten steel with stainless steel interior trim; mild steel galvanized with stainless steel interior trim; and mild steel with stainless steel interior trim.

(Rubber-seated stock valves are a product of Fabri-Valve Co. of America, Dept. CP, 2100 N. Albina Avenue, Portland 12, Oregon . . . or for more information check CP 5365 opposite last page.)

Uses of flow control pumps in petroleum processing

Typical uses of flow control pumps in petroleum processing are described in three engineering data sheets. Applications covered in detail include cooling tower pH control, desaponification of crude oil, and corrosion control in process towers.

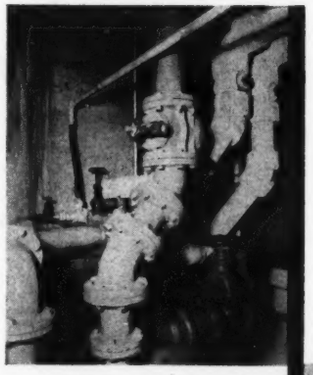
Data sheets E-54-2, E-54-3, and E-54-4 are available from Station T, Milton Roy Company, Dept. CP, 1300 East Mermaid Lane, Philadelphia 18, Pa. Specify CP 5366 opposite last page.

THE "HOLE" TRUTH ABOUT round port plug valves

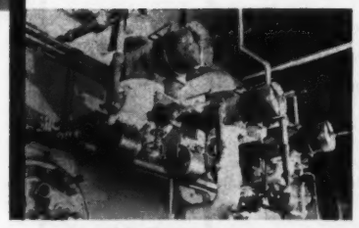
The truth is: no other opening will give you the flow perfection of a round hole! Because acf Round Port Valves are the exact size and shape as the pipe itself...you get smooth, unrestricted flow of even the most heavy viscous ladings. There are no obstructions...no loss in head pressure...no turbulence and harmful abrasive effects from solids in suspension.

Quarter-turn shut off! Full pipe area opening! Non-wedging design! All these features are found in *both* acf Round Port Valves and Rectangular Port Valves. Their extra long service life with minimum maintenance will save you money in the long run. And that's the truth!

Representatives in 50 Principal Cities. Write for descriptive Catalog 5-CP acf Industries, Incorporated, Valve Division, 1501 E. Ferry Avenue, Detroit 11, Michigan.



In Sewage treatment

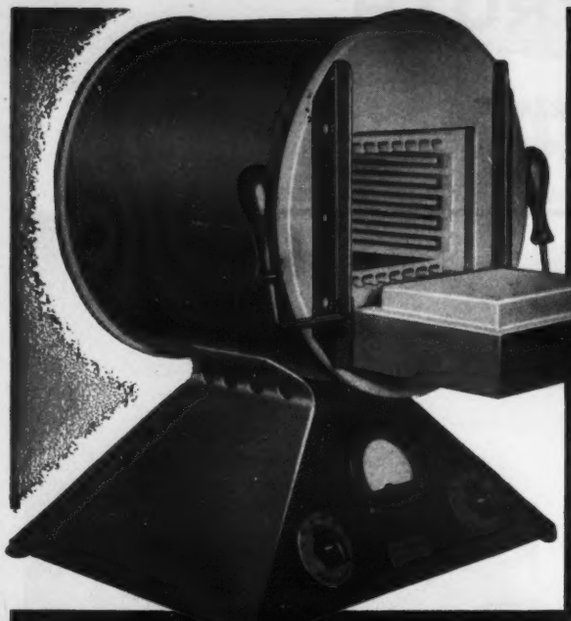


In Steel Plants

In the Cement Industry

acf CYLINDRICAL FULL PIPE AREA PLUG VALVES

When inquiring check CP 5367 opposite last page



HEVI DUTY
"MULTIPLE UNIT"
MUFFLE FURNACE
For Temperatures To 2000° F.

Instruments and Controls operate at approximately room temperature . . . there is no trapped heat.

As a result of correct insulation design, you can shift rapidly to desired operating temperatures.

Reversible and easily replaceable Multiple Units, time-tested for 30 years, have been retained.

36 steps of control through a Hevi Duty Tap-Changing Transformer allows maximum flexibility of control.

Controls are mounted in a recessed position for safety and at correct angle for proper vision.

Rear panel is removable for access to terminal board. Release of front panel permits control assembly to slide forward.

This furnace has been designed for general laboratory requirements such as drying of precipitates, ash determinations, fusions, ignitions, heating metals and alloys, enameling, heat treating, and experimental test work.

The efficient Hevi Duty Muffle Furnace shown is housed in a cylindrical shell mounted on a pyramidal type base with practicaly line contact between them . . . allowing for free circulation of air and eliminating trapped heat in the base. Available in four standard sizes.

For complete details, construction, and specifications, see your Laboratory Supply Dealer, or write for Bulletin LAB-849.

"MULTIPLE UNIT"

HEVI DUTY ELECTRIC COMPANY
MILWAUKEE 1, WISCONSIN
Heat Treating Furnaces... Electric Exclusively
Dry Type Transformers *Constant Current Regulators*

When inquiring check CP 5368 opposite last page

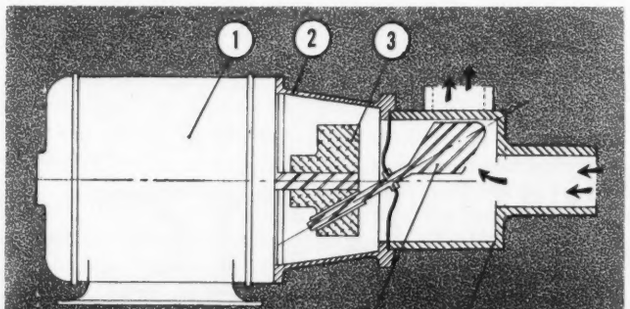
Operating on the vibratory principle, this unit, which needs no lubrication and has no packing —

pumps troublesome abrasives

Unusual design and construction materials protect pump from damage by coarse or corrosive liquids

Uses: Although suitable for general liquid-pumping applications, unit is particularly applicable where abrasive slurries or corrosive liquids must be handled.

Features: Since impeller shaft does not rotate, pump has no packing ring or gland and needs no lubrication where shaft passes through diaphragm. Tests have proved the unit successful in handling such feeds as heavy mixtures of sand and water, sludge coolants and lubricants, suspensions of carborundum or alumina, and even liquids containing rivets, beans, and elbow marcaroni. In addition, tests have shown the pump capable of handling such



Pump components include: motor (1), mounting bracket (2), rotor hub (3), impeller (4), and pump body (5)

corrosives as fruit pulp, bromine, hydrofluoric acid, and concentrated brines.

Diaphragm can be of any flexible material, either natural or synthetic elastomer, to protect against damage by fluids handled. Likewise, the impeller and pump body may be of porcelain, carbon, bronze, stainless, or any plastic suitable for handling abrasive, corrosive, hot, or otherwise troublesome materials.

Description: Called the Vibro-Pump, unit operates on the vibratory principle. As shown in drawing, motor (1) turns rotor hub (3) which is driving member for shaft and impeller (4). Impeller and shaft do not rotate, but impel liquid (arrows) with the same motion that a housewife would impart to a wooden spoon while stirring cake batter. Shaft or motor side is contained in anti-friction bearing.

Other components of pump (see drawing) are cast mounting bracket (2) used as a rigid spacer between pump body and motor, and cast pump body (5). Chemical- and fatigue-resistant diaphragm is represented by the heavy black wavy line. For driving the pump, electric motor of variable speed up to 3600 rpm and 1 hp may be used. Model shown in photo utilizes a 1/6-hp motor with 1" inlet and outlet. Larger sizes are available.

(Vibratory pump is produced by H & H Manufacturing Co., Dept. CP, Clifton Heights, Pa. . . . or check CP 5369 opposite last page.)

Slight change in controlled pressure corrected quickly by pilot-operated steam reducing valve

Uses: In most steam reducing valve installations.

Features: Although sensitive, unit's simple operation provides trouble-free service. Downstream pressure is sensed by diaphragm of pilot valve. Pilot uses upstream pressure to open main valve if downstream pressure is too low; if too high, it bleeds off pressure, allowing main valve to close as required. Action is accomplished without appreciable variation in downstream pressure as correction is made almost instantaneously.

Description: Pilot-operated steam reducing valve, designated No. 933, has a large balanced diaphragm providing positive main valve action without hesitation, wide pressure variations, or sticking.

Valve is manufactured in sizes from ¾ to 6". Sizes below 2" have bronze bodies; larger sizes are semi-steel. Stainless steel discs and seats are used in sizes 4" and smaller; 5 and 6" sizes are supplied with bronze inner valves and seats, but can be furnished with stainless trim on special order.

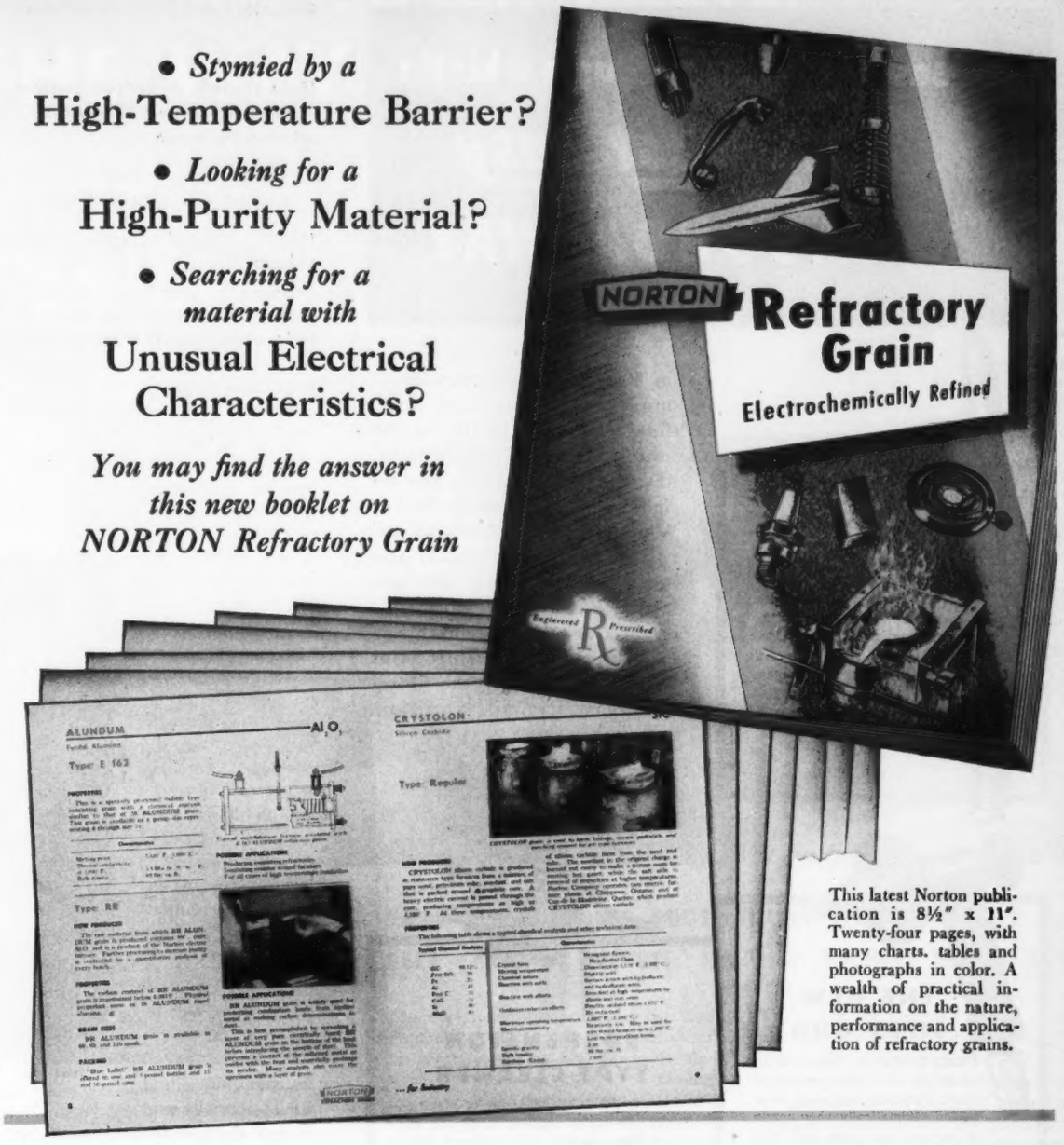
(Steam reducing valve is a product of Klipfel Valves, Inc., Dept. CP, 1075 Lincoln Ave., Hamilton, Ohio. Check CP 5370 opposite last page.)

• *Stymied by a*
High-Temperature Barrier?

• *Looking for a*
High-Purity Material?

• *Searching for a material with*
Unusual Electrical Characteristics?

You may find the answer in this new booklet on NORTON Refractory Grain



This latest Norton publication is 8½" x 11". Twenty-four pages, with many charts, tables and photographs in color. A wealth of practical information on the nature, performance and application of refractory grains.

IF you're concerned with industrial processing involving temperatures ranging upwards to 4000°C and materials to contain your inferno — if you're looking for a high-purity material such as high-purity fused alumina for coating electronic heater filaments — if you're searching for a material with unusual electrical characteristics such as E 179 CRYSTOLON* Silicon Carbide for lightning arrestors — one of the many types of Norton Refractory Grain available may solve your problem.

This new booklet describes in detail Norton Refractory Grain — produced and purified in electric arc and high temperature resistance furnaces — which is helping industry to improve existing products and processes and to create new ones.

It's a valuable reference book with up-to-the-minute information on the chemical and physical characteristics of such materials as CRYSTOLON* Silicon Carbide, ALUNDUM* Aluminum Oxide, MAGNORITE* Magnesium Oxide, Fused Zirconia and Boron Carbide. In it you'll find data on how these materials are produced; their behavior under varying conditions; available grain size and applications.

These electrochemically refined materials may be just what you've been looking for to solve your problem. Write today for your free copy of "Norton Refractory Grain." NORTON COMPANY, Refractories Division, 561 New Bond Street, Worcester 6, Mass.

NORTON
REFRACTORIES
Engineered... Rx... Prescribed
Making better products... to make your products better
*Trade-Marks Reg. U. S. Pat. Off. and Foreign Countries

When inquiring check CP 5371 opposite last page

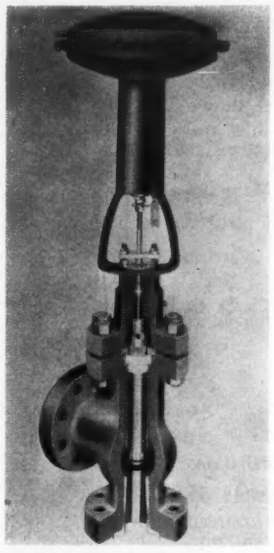
Tight shutoff, balanced control at high pressure differential offered by valve . . .

unit's design eliminates plug unbalance often found in single-seated valves

Uses: Control valve applications in the process industries.

Features: Unit gives balanced control at high pressure differentials with tight shutoff. Valves embody advantages of corrosion-resistant retained seat ring, reduced turbulence, venturi throat design, and large flow capacity. In addition, design of unit eliminates plug unbalance usually associated with single seated valves.

Description: In operation, force caused by line pressure working against cross sectional area of plug is cancelled out by means of a drilled hole along axis of plug, intersecting radially drilled holes near the top. Thus, line pressure is transmitted through this passage and exerts a downward force on plug equal to upward force. As a result, valve may be positioned accurately at pressure differentials as high as 3600 psi with standard superstructures actuated by standard instrument air output.



Valve has large flow capacity

Tight shutoff is attained by sealing pressure in body bowl from balancing chamber with seal. With plug on its seat, line fluid would normally tend to flow through space between plug and guide and continue through drilled passage to downward stream.

This is prevented by interposing seal around plug near top of guide. Made of an inert, frictionless plastic, seal requires no attention or maintenance and is completely resistant to corrosion or chemical attack in operation.

Seal-balanced angle valves are manufactured in sizes from 1 to 8" with body ratings from 150 to 1500 psi ASA standard at a temperature rating of 450°F.

(Control valves are a product of Hammel-Dahl Co., Dept. CP, 175 Post Road, Providence 5, R. I. . . . or for more information concerning manufacturer's product, reader may simply check CP 5373 on the convenient Reader Service slip which is located opposite last page.)

Get small tubes clean as a whistle

the fast easy

LAGONDA WAY

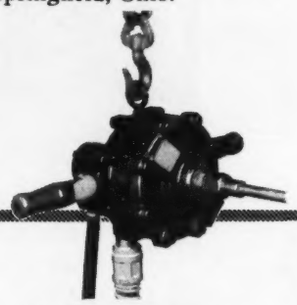
THE 600 SERIES

Air or steam driven motor for straight or curved tubes. A wide assortment of brushes or cutter heads can be adapted to this slim powerful motor. Flexible couplings are used for curved tubes. Operated at pressures of 80-100 psi, requires from 10 to 30 cu. ft. of air per minuute.

● You can make short work of sludge, soft deposit and sometimes even hard scale, in any straight or curved tube from ½" I.D. and up, when you put the right Lagonda cleaner on the job. While cleaning is thorough and rapid, the cutter heads and brushes will not mar tube surfaces. For additional information on these or other Lagonda cleaners—contact your Elliott Sales Engineer or write to the Elliott Company, Lagonda Division, Springfield, Ohio.

THE NEW JIFFY GUN

Shoots brushes or plugs through condenser or heat exchanger tubes. Water or air pressure is released automatically when nozzle is pressed into tube end. Gun weighs but 2 pounds. Fits all tubes from ¼" to 1¼" I.D. Special nozzles are furnished for other sizes. Spiral wound nylon brushes and rubber composition plugs available in all sizes.



SUSPENSION TYPE CLEANER

For straight tubes only. Air or electric drive. Air motor requires 80 to 100 lb. operating pressure. It's equipped with double ball thrust bearings to compensate for push and pull on the cleaner. Trigger control gives instant start-up the moment the cutter or drill enters the tube, controls water supply too. Two electric motors available, light-duty for tubes up to ¾"—heavy-duty for larger tubes. May be used AC or DC.

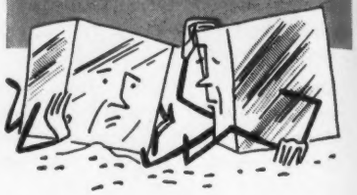
Y4-B

ELLIOTT Company

STEAM TURBINES • MOTORS • GENERATORS • DEAERATING HEATERS • EJECTORS • CONDENSERS • CENTRIFUGAL COMPRESSORS • TURBOCHARGERS • TUBE CLEANERS • STRAINERS

When inquiring check CP 5372 opposite last page

The case of the grounded ice cubes . . .



The operations of a Buffalo ice-making plant came to a costly impasse. Ice cubes were grounded for want of some way to unclog their transporting devices. Hammering was slow and often damaging to the equipment.

There was a solution, however, that solved the problem economically and swiftly . . . a CLEVELAND vibrator.

Let us know about your grounded material, or ask for our detailed literature. Engineering recommendations without cost or obligation.

AIR *and* ELECTRIC

2706 Clinton Avenue • Cleveland 13, Ohio

When inquiring check CP 5374 opposite last page

Easily-carried unit pumps solvents from drums . . .

self-priming centrifugal handles up to 8 gpm

Uses: Pumping solvents and other liquids from drums. Other jobs handled include moving solvent from machine to storage, emptying storage tanks, and pumping from still accumulation tanks.

Features: Unit will prime itself automatically and operate continuously when placed as much as 15 feet above liquid supply. Performance is quiet and efficient. Small solids in liquid create no problem and pass through pump without causing damage.

Description: Known as the GEM, self-priming centrifugal pump is powered by either a ¼ hp or 1/3 hp electric motor. It is provided with ¾" garden hose adapters and will handle up to 8 gpm through 50 feet of hose.

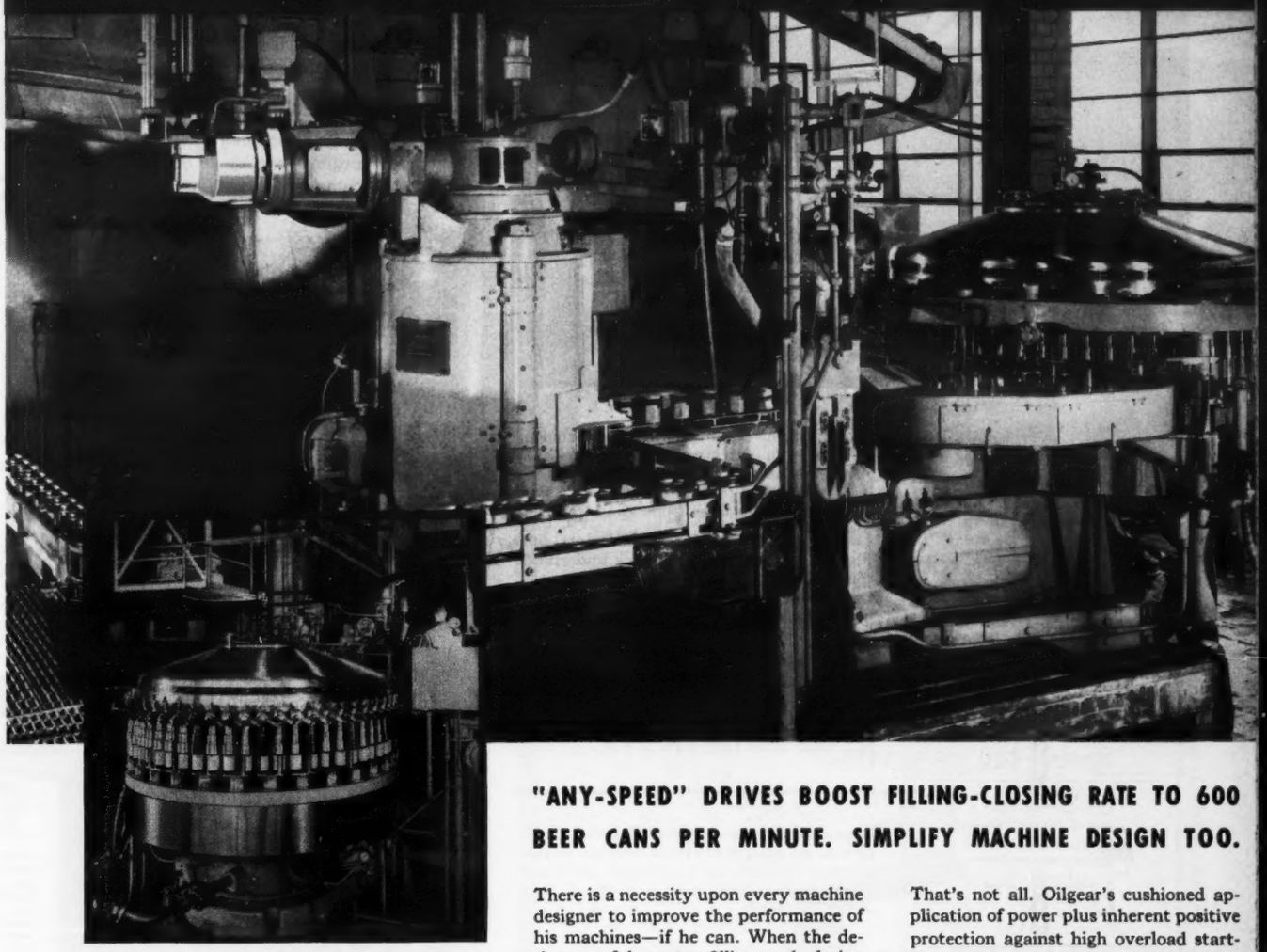
Small solids in liquid pumped will not cause damage

There are no parts to wear and maintenance is negligible. A self-lubricating mechanical shaft seal eliminates any need for pump lubrication. Seal is leak-proof and there is never any hazardous leakage of solvents or other liquids.

(Self-priming centrifugal pump is a product of Marlow Pumps Division, Bell & Gosset Company, Dept. CP, 8200 N. Austin Ave., Morton Grove, Ill. . . . or for more information check CP 5375 on handy form opposite last page.)

For more information on product at right, specify CP 5376 . . . see information request blank opposite last page.

You too can discover THE WAY UP IS OILGEAR



Beer Can Filling and Closing Machines equipped with Oilgear "ANY-SPEED" Drives are operating in many breweries. With Oilgear, beer can filling and closing production climbed from 360 to 600 cans a minute.

"ANY-SPEED" DRIVES BOOST FILLING-CLOSING RATE TO 600 BEER CANS PER MINUTE. SIMPLIFY MACHINE DESIGN TOO.

There is a necessity upon every machine designer to improve the performance of his machines—if he can. When the designers of beer-can filling and closing machines raised the rate from 150 to 360 cans per minute, the drive limit seemed to be reached. Yet, their users wanted more production *without spillage* or can conveyor problems.

Then these engineers tried Oilgear "ANY-SPEED" Drives . . . the Fluid Power and Control that gave them what they wanted and—even more.

These engineers stipulated: • accelerate machines to half speed in 2 seconds • accelerate machines to full speed in 5 seconds • decelerate and stop machines in 4/10 seconds • a filling-closing rate of 425 cans per minute.

The Oilgear drive accelerated and decelerated so smoothly, it actually provided: • acceleration to full speed in 2 seconds • deceleration and stop in 2/10 seconds • a filling-closing rate of 600 cans per minute.

That's not all. Oilgear's cushioned application of power plus inherent positive protection against high overload starting torques and lower overload running torques eliminated the need of mechanical slip clutches. Thus, the machine design is simplified and maintenance is negligible.

This smooth yet swift acceleration and deceleration that allows brewers to handle full cans without spilling is one of two tremendously important Oilgear advantages. Utterly variable, flexible and controllable speed is the other. These and other superiorities are writing new history in machine design. *You ought to know the details of that history.* Why don't you contact a nearby Oilgear engineer, or write to Milwaukee. No cost, but the profits may be great.

OILGEAR Fluid Power

PIONEERS . . . NOW THREE PLANTS FOR FLUID POWER

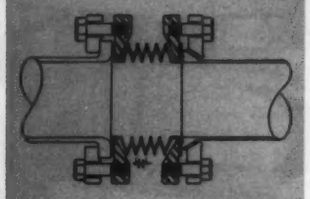
PUMPS, MOTORS, TRANSMISSIONS, CYLINDERS & VALVES

THE OILGEAR COMPANY
1583 W. Pierce Street
Milwaukee 4, Wisconsin

Chemiseal Gaskets

MADE OF TEFLON du Pont Trademark

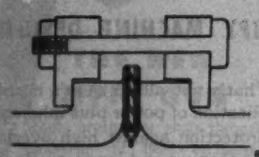
and Accessories for Glass Piping



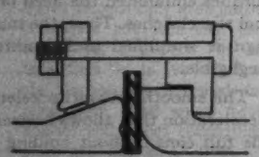
ABOVE: Chemiseal Snap-on Gaskets, molded of TEFLON to match contour of conical end glass pipe, assure perfect automatic centering of joints and free flow of materials. For all standard pipe sizes from ¼ in. to 6 in.

AT LEFT: Chemiseal Expansion Joints and Flexible Couplings absorb shock and vibration, thermal expansion and contraction. Correct misalignment. Connect unlike piping ends and nozzles.

Chemiseal TEFLON-Jacketed Gaskets, standard for Corning conical flanges. Seal at low bolt loads. Sizes from 1 in. to 6 in.



Chemiseal TEFLON-Jacketed Gaskets. Compressed asbestos sandwiched between woven asbestos inclosed in a TEFLON envelope. Ideal for glass-lined steel connections. Seal at low bolt loads.



Chemiseal Adaptors provide a safe, tight seal between unlike piping ends and nozzles. A steel bearing ring provides rigidity. Resilient core assures positive seal. TEFLON Jacket protects and contains easy-to-handle single unit.

WRITE FOR CATALOG NO. TG-953.

UNITED STATES GASKET COMPANY • CAMDEN 1, NEW JERSEY

USG

FABRICATORS OF FLUOROCARBONS & OTHER PLASTICS

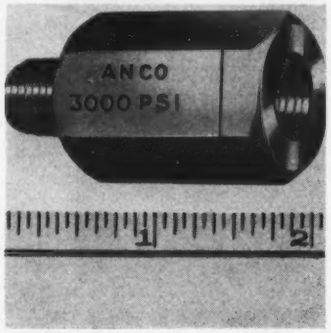
Representatives in principal cities throughout the world

When inquiring check CP 5377 opposite last page

Prevents gage failure due to shock

Uses: For protection of gages in either liquid or gas service.

Features: Damaging effects due to shock and wide pressure fluctuations are prohibited by protector unit. It also furnishes more accurate gage readings because it does away with "shimmy".



Protector valve is easily installed

Valve can easily be restored to normal operation if impurities are present in system. It does not become permanently plugged by impurities, and can be readily cleaned.

Description: Gage protector valve is easy to install, and has no moving parts to get out of order. Unit is available in steel (0-5000 psi), brass (0-3000 psi), or stainless steel (0-5000 psi).

Sizes available are ¼ and ½" NPT. Female threads are used on gage side, male threads on pressure side of line.

(Gage protector valve is a product of Anco Division, American Associates, Inc., Dept. CP, One Baker St., Providence 5, R. I. Check CP 5378 opposite last page.)

Engineering operations, equipment described

Company's diversified manufacturing activities are described in 50-page brochure.

"This is Blaw-Knox" is issued on letterhead request to Blaw-Knox Co., Dept. CP, Farmers Bank Bldg., Pittsburgh 22, Pa.

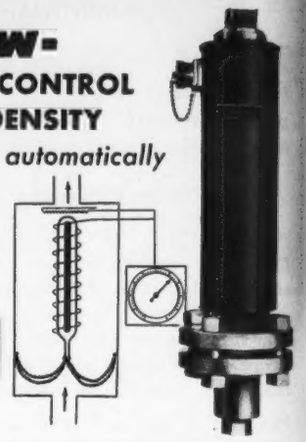
now-

MEASURE, CONTROL LIQUID DENSITY

continuously and automatically with the

PRINCO Since 1910

Densitrol



Process industries will welcome the new DENSITROL—the precision instrument that gives a continuous reading of density in flowing liquids such as sugar syrups, brine, acids. DENSITROL electrical indicators or recorders can be located remote from the sampling chamber itself. If desired, DENSITROL can be linked with control mechanisms for automatic regulation. For information on temperature and pressure ranges, calibrations, and other specifics, request Bulletin W-3.

PRECISION

THERMOMETER & INSTRUMENT CO.

1434 Brandywine Street, Philadelphia 30, Pa.

Makers of precision-built thermometers, barometers, hydrometers, gauges, indicators, mercury in glass thermo-regulators.

When inquiring check CP 5379 opposite last page

SPERRY

FILTRATION ECONOMY — UNLIMITED

Every feature of each Sperry Filter Press is designed for extra efficiency, greater value. You get maximum clarity. A filter that handles any product, uses the simplest filter media or base, requires less cost, less space, less upkeep. All the advantages which help make Sperry foremost in filtration.

For the complete story, send for Sperry's big, brand-new catalog. An insight into the filtration picture — with charts, specifications, models and money-saving facts. Write for your copy today. It's free!

D. R. SPERRY & CO., BATAVIA, ILL.

Filtration Engineers for Over 50 Years

Eastern Sales Reps: George S. Tarbox, 808 Nepperhan Ave., Yonkers 3, N. Y., Yonkers 5-8400

SPERRY FILTER PRESSES

Western Sales Reps: R. M. Pilhashy, 833 March. Exch. Bldg., San Francisco 4, Calif., DO 2-0875

When inquiring check CP 5380 opposite last page

IT COSTS LESS—

to do a FASTER, EASIER, MORE EFFICIENT cleaning job on your equipment.

Whether it's glass piping systems, metal, plastic or glass lined tanks, food kettles, laboratory equipment, optical lenses, etc. ALCONOX can, and will clean thoroughly, safely and at a low cost of less than 2½ cents per gallon.

Its extremely high degree of wetting power, stability and penetration has already placed Alconox at the top of the list: Its low cost only adds to this distinction.

We invite you to check all brands and their prices. Then compare with WORLD-FAMOUS, TIME-PROVEN ALCONOX.

Convince yourself: Then place your order.

Literature, samples and the name of your nearest distributor on request.

AVAILABLE IN

BOX of 3 lb.	$1.95
CARTON of 12 boxes of 3 lbs.	18.00
DRUM of 25 lbs.	.45 lb.
DRUM of 50 lbs.	.40 lb.
DRUM of 100 lbs.	.40 lb.
DRUM of 300 lbs.	.37 lb.

Slightly higher on Pacific Coast.

ALCONOX, INC.

WETTING AGENTS DETERGENTS

61-63 Cornelison Ave. Jersey City 4, N. J.

When inquiring check CP 5381 opposite last page

Dry, lubricating coatings offered by two dispersions containing epoxy resins as base

Uses: Typical applications include dry lubricating films for high-temperature screw threads, precision gears, bearings, and shafts.

Features: Two products are offered — one containing colloidal graphite and the other containing colloidal molybdenum disulfide. Both offer advantages of having epoxy resins as a base for dry, lubricating coatings.

Films properly formed with these dispersions show excellent adhesion and wear-resistance. They are unaffected by oils and solvents, and can be used wherever temperatures do not exceed 500°F. All kinds of surfaces, whether or not pretreated by chemical or mechanical means, can be coated. Corrosion resistance, as well as lubrication, can be obtained from these films.

Description: 'dag' Dispersion No. 213 (with colloidal graphite), with solids content of 28.5%, can be sprayed full-strength. Undiluted, No. 213 forms films less than 0.5 mil thick, at 25-40 psi air pressure using a normal paint spray-gun. Viscosity can be reduced by diluting with solvent mixture containing equal parts of toluol and Cellosolve acetate.

'dag' Dispersion No. 223 (with colloidal molybdenum disulfide) has a solids content of 63% by weight, but consistency remains liquid. It is offered as a counterpart to No. 213 where a molysulfide film is specifically desired.

Both dispersions are fully compatible, and can be mixed to produce films containing both colloidal graphite and molybdenum disulfide. Both dispersions are treated alike, so far as dilution, methods of application, and the like are concerned.

For dipping, no more than half again as much solvent mixture should be added to these products (dispersion-to-solvent ratio 2:1); for brushing, they can be extended further, to a 1:1 ratio. Full value of epoxy resin films is realized by curing coatings at 350°F for 30 min, or at 400°F for 20 min.

(Lubricating coatings are products of Acheson Colloids Company, Dept. CP, 2150 Washington Ave., Port Huron, Mich. Check CP 5382 opp. last page.)

Tips on hand threading stainless pipe

To those confronted with the task of hand threading stainless steel pipe, data card gives helpful hints.

TDC 147 is available from Tubular Products Division, The Babcock & Wilcox Company, Dept. CP, 4029 4th Ave., Beaver Falls, Pa. When inquiring specify CP 5383 opposite last page.

HOKE

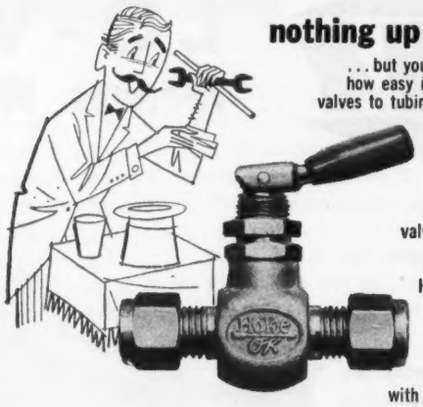
Flow Sheet

Hoke reports on fluid control

we're giving you the needle

... to help you control small flow rates easily and accurately. The needle point in a Hoke Metering Valve is just 8° wide and it takes 20 turns of the handle to move the point 3/8 of an inch, the effective throttling length. In addition to this precise control, the Metering Valve has an O-ring stem seal (... so tight it'll pass a Helium Leak Test) and is available for instrument panel mounting.

Interested? ... write for catalog and data sheets.



nothing up our sleeve

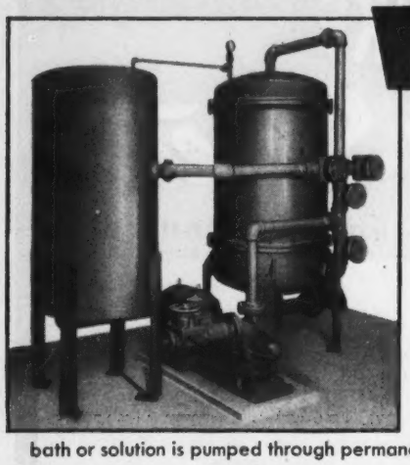
... but you'll be amazed to see how easy it is to connect Hoke valves to tubing the Swagelok way. No swaging, no sweat, no swearing ... in fact, it's no trick at all to achieve a permanent valve-to-tube connection with a turn and a quarter of a wrench. Hoke makes precision needle valves, on-off toggle valves, check valves — in brass and stainless — equipped with Swagelok tube ends. Ask for Bulletin SV854.

HOKE INCORPORATED

Fluid Control Specialists

When inquiring check CP 5384 opposite last page

WAGNER BROTHERS FILTERS OFFER CHEMICAL PROCESSORS



DOUBLE ECONOMY

LOW OPERATING COST • LOW MAINTENANCE COST

CONSIDER TWO FACTORS BEFORE YOU SPECIFY FILTERING EQUIPMENT:

1 The gallons of solution which can be efficiently filtered in a given period of time.

2 The cost of maintaining the filtering mechanism.

It's an established fact that Wagner Brothers Filters have a higher effective flow rate than any other equipment with *equal filtration area* . . . thus, gallon for gallon, it delivers *more* pure filtrate *per hour* at a lower unit cost. Sludge and other suspended matter (down to 1/10 micron) are removed when the bath or solution is pumped through permanent membranes caked with a few cents worth of filter-aid (diatomaceous earth).

To clean, you simply turn a few valves and reverse the flow. Air bump backwash shocks the caked filter-aid from the membranes and through the sludge drain. Maintenance costs are reduced to ½ that of ordinary industrial filters since there is no messy replacement of bags, sheets or pads, no manual cleaning labor, no dismantling.

Standard models are available in capacities from 500 GPH up, filter areas from 3 to 100 square feet.

We design and build specials to suit your requirements. Write for detailed information and filtering questionnaire.

Wagner **BROTHERS, INC.**

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CHICAGO • ROCHESTER • CLEVELAND • CINCINNATI • INDIANAPOLIS • ST. LOUIS • NEW YORK

When inquiring check CP 5385 opposite last page

AJAX

LO-VEYOR

Features Worth Looking Into

Convey dry aggregate materials by vibration
Sizes 5 microns to large lumps.

Scalp, sort, wash, cool, dry. Handle inflammable, corrosive, poisonous, abrasive or explosive materials.
Self-contained, easy to install.

No belts, rollers or exposed bearings.

Write for Bulletin 39

FOR CONVEYING BULK MATERIALS

Open or covered pan and tubular types.
Wide variety of sizes.
Thousands in use.

AJAX **LO-VEYORS**

AJAX FLEXIBLE COUPLING CO. INC. WESTFIELD, N. Y.

When inquiring check CP 5386 opposite last page

new literature

Industrial bulletins pertinent to the reader . . . offering data on products, processes, services

High-speed framing cameras explained in folder

Illustrated four-page folder describes two models of manufacturer's high-speed framing cameras. Designed for engineering and research studies of combustion, corona-discharge, explosion, plastic- and elastic-deformation and shock-wave phenomena, two cameras are capable respectively of 1.2 million and 2.4 million frames per second. Descriptive material covers the overall operation of the camera. Details of the optical system, special features of the equipment and its remote control facilities, and an overall schematic view of the camera system are included.

Form 189 is issued by Beckman & Whitley, Inc., Dept. CP, 960 E. San Carlos Ave., San Carlos, Calif. When inquiring specify CP 5387 on handy form opposite last page.

All types of tank gaging systems described in 76-page bulletin

Liquid level indicators for fixed roof tanks, remote tank level gaging systems, pulse code telemetering systems, and high/low level alarms are illustrated and explained in 76-page bulletin. Complete specifications and operational drawings show operations of various systems.

Bul CP-3007 is issued by The Vapor Recovery Systems Co., Dept. CP, 2820 N. Alameda St., Compton, Calif. When inquiring specify CP 5388 on handy form opposite last page.

Resin promoting rubber-fabric bond subject of technical data sheet

Water-soluble, phenol-formaldehyde resin, Gen-Tac Resin, for use in dip preparations to obtain adhesion between rubber and fabric, is subject of two-page data sheet. Resin preparation, formulation data, and test results are given.

"Gen-Tac Resin" is issued by Harwick Standard Chemical Co., Dept. CP, 60 S. Seiberling St., Akron 5, Ohio. When inquiring specify CP 5389 on handy form opposite last page.

Recommended universal standards for steel drums and pails

Developed through the joint efforts of the Petroleum Packaging Committee and the Steel Shipping Container Institute Technical Advisory Committee, recommended universal standards for steel drums and pails are presented in 15-page brochure.

Specifications included are for 55, 30, and 16-gallon steel drums, and 5-gallon steel pails.

"Recommended Universal Standards for Steel Drums and Pails" is available from Steel Shipping Container Institute, Inc., Dept. CP, 600 Fifth Avenue, New York 20, N. Y. When inquiring specify CP 5390 on handy form opposite last page.

Sphere-segment gear teeth improve efficiency

More efficient coupling having gear teeth which are cut on a segment of a sphere is described in eight-page catalog. Coupling is called the Sphereflex, and male teeth of each coupling half are cut on a true spherical arc while internal teeth are cut with a straight root. Thus, whenever misalignment occurs, curved tooth maintains a constant area of contact with internal tooth.

Cat C-540 is available from Philadelphia Gear Works, Dept. CP, Erie Ave. & G St., Philadelphia 34, Pa. Check CP 5391, opposite last page.

Application recommendations for low-temp insulation

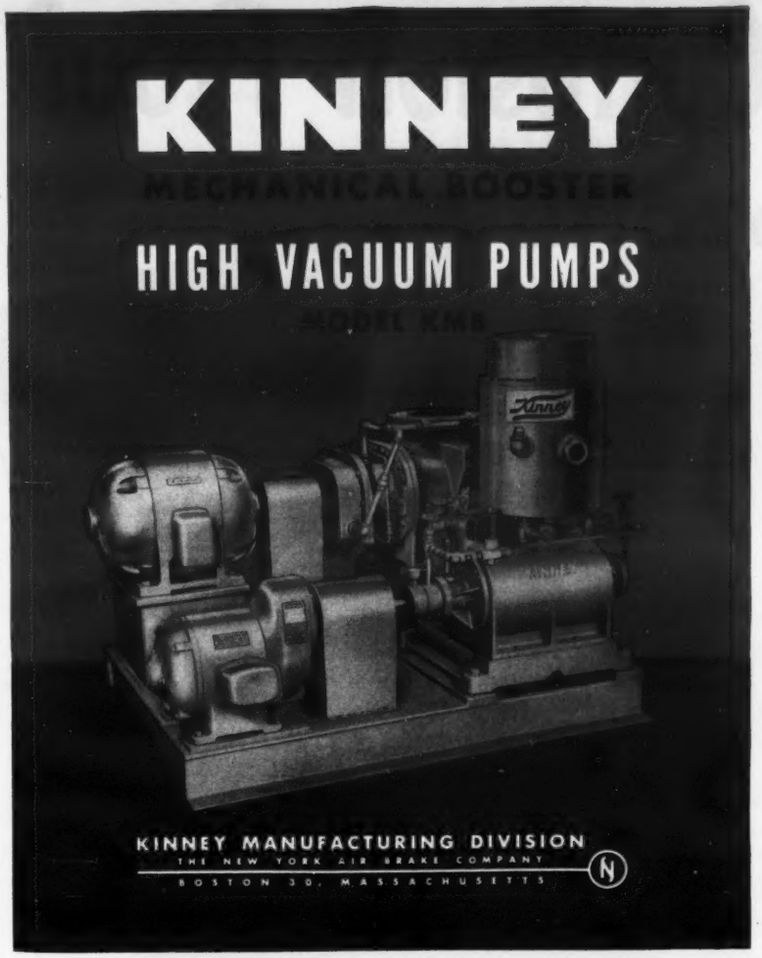
Illustrated folder provides a complete picture of insulating properties, as well as helpful recommendations on how to order and apply low-temperature pipe insulation. Detailed specification sheets and other data are included.

Bulletin on Vapo-Wall is issued by MMM, Incorporated, Dept. CP, 7120 Avenue C, Houston, Texas. Check CP 5392, opposite last page.

Catalogs variety of apparatus for laboratory use

Bulletin of 16 pages describes laboratory scales, washing machines, pH meter, shakers, acid pump, low temperature cabinet, and other recently introduced apparatus.

No. 21 "What's New for the Laboratory" is issued by Scientific Glass Apparatus Co., Inc., Dept. CP, Bloomfield, N.J. When inquiring specify CP 5393 on handy form opposite last page.



IT'S THE LAST WORD ABOUT THE LATEST IN VACUUM PUMPS!

ASK FOR YOUR COPY TODAY

THIS NEW BULLETIN presents the Kinney Mechanical Booster Pump which produces eight times more vacuum pumping speed per pump horsepower than any other mechanical vacuum pump. Unique in principle and revolutionary in performance; it is a two-stage, positive displacement pump which has high volumetric and mechanical efficiency over a wide range of pressures . . . there's no liquid sealant in the main rotor unit to backstream into the vacuum system and contaminate the process. The second stage pump can be equipped with the Kinney **CONTROLLED GAS BALLAST** Valve to prevent vapors condensing within the pump . . . keeps oil clean for continuous operation. Kinney Model KMB is the latest addition to the Kinney High Vacuum Pump line which now includes thirteen models — the world's largest line of Mechanical Vacuum Pumps. Learn more about this new pump. Write for Bulletin 400 or contact one of our competent vacuum engineers in the Kinney district office nearest you.

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THE NEW YORK AIR BRAKE COMPANY
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Please send Bulletin No. 400 describing the new Model KMB High Vacuum Pump.

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Company.....
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When inquiring check CP 5394 opposite last page

100% Corrosion-Proof

A-C. MOTORS

Here is a corrosion-proof chemical motor with enough flexibility to fit *your* requirements. It's *Totally* Protected.

Interesting features about this motor are brought out in detail in a new booklet entitled "From Naphtha to Grain Dust". It's worthwhile reading to find out *why* this motor has won wide-spread recognition in the chemical field.

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Canadian Division: Welland, Ontario

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Builders of the Tools of Automation

RELIANCE V★S DRIVES

NEW LITERATURE

Metal conveyor belts shown in 36 pages

Illustrated 36-page catalog shows variety of meshes available in manufacturer's line of steel conveyor belts. Allied equipment such as flights, drive sprockets, and idler sprockets are also described and illustrated. Various forms of drives and take-up methods are discussed along with installation and care of steel belts.

Cat No. 5 is issued by Cyclone Fence Dept., American Steel & Wire Division, U. S. Steel Corp., Dept. CP, P. O. Box 260, Waukegan, Ill. When inquiring specify CP 5395 on convenient Reader Service slip opposite last page.

Gives technical data on flowmeters

Illustrated four-page bulletin shows construction features and gives specifications on multiple stage flowmeters. Meters handle alcohol, chemicals, oils, water, diesel fuel, gasoline, and jet fuel.

Bul 1052 is issued by Commercial Research Laboratories, Inc., Dept. CP, 20 Bartlett Ave., Detroit 3, Michigan. When inquiring specify CP 5396 opposite last page.

Mentions mica

Used as a stock dusting material and as a mold lubricant primarily in the rubber industry, Silversheen Mica is described by data sheet #10-50-2-3-54 issued by Harwick Standard Chemical Co., Dept. CP, 60 S. Seiberling St., Akron 5, Ohio. When inquiring specify CP 5397 opposite last page.

For more information on product at left, specify CP 5398 . . . see information request blank opposite last page

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"Metalsmiths" Stainless Steel and Monel Utensils

Prompt shipment —anywhere!

Order your next requirements in corrosion-resistant utensils from the quality "Metalsmiths" line. Latest catalog shows all stock items, sizes, prices. Order direct and compare "Metalsmiths" workmanship, quality materials, long, durable service. Over 30 years serving the trade.

WRITE FOR LATEST CATALOG — PRICE LIST

METALSMITHS

Division of **Orange Roller Bearing Co., Inc.**

356 White Street Orange, N. J.

When inquiring check CP 5399 opposite last page

you save 50% in TANK HEATING and COOLING with PLATECOIL

(REPLACE PIPE COILS)

★ **You SAVE 50% in tank SPACE**
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★ **You have 50% LESS WEIGHT to handle**
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. . . besides all these you get faster heating or cooling. Take advantage of the engineering assistance offered by Kold-Hold to help you with your heat transfer problems.

Send for complete technical manual and descriptive Bulletin No. P54

PLATECOIL by **Tranter Mfg. Inc.** LANSING 4, MICHIGAN

When inquiring check CP 5400 opposite last page

NEW LITERATURE

Linings stay pliable handling corrosives

Application of flexible Koroseal sheet to plating tanks, racks, and vats is discussed and illustrated in four-page bulletin. Considerable data is given on this lining which stays soft and pliable even with strong oxidants.

Typical materials handled include nitric, sulfuric, and chromic acids, bleaches, ammonium hydroxide, barium sulfide, caustic, plating solutions, and many organics.

Bulletin on Koroseal lining is available from Protective Coatings Division, Metalweld, Inc., Dept. CP, Scotts Lane and Abbottsford Ave., Philadelphia 29, Pa. Check CP 5401 opposite last page.

Shows equipment needed for a disaster

Booklet, designed to assist industrial plants in choosing safety and rescue equipment for use in emergency, is separated into five sections. Discussed are such items as equipment needed by rescue teams, engineering teams, and medical teams.

Bul 5000-4 is published by Mine Safety Appliances Co., Dept. CP, 201 N. Braddock Ave., Pittsburgh 8, Pa. Check CP 5402 opposite last page.

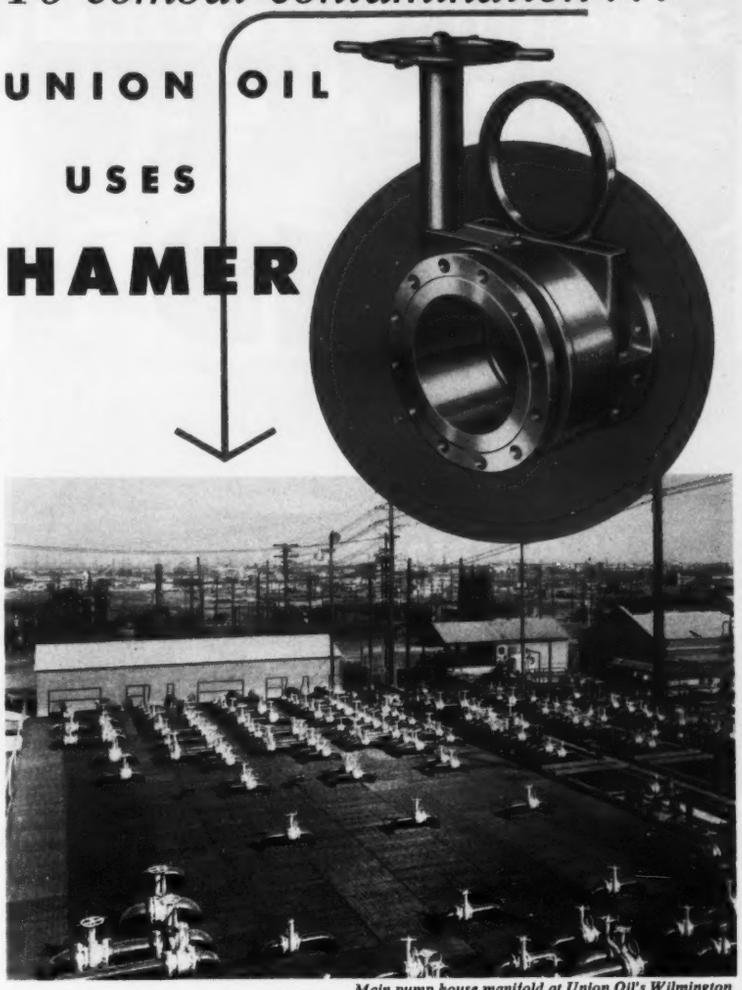
Presents developments in natural rubbers

Digest size magazine, published quarterly, presents articles on technical developments of uses for natural rubber. In addition to technical papers, each edition carries new product notes.

Rubber Developments is issued quarterly by Natural Rubber Bureau, Dept. CP, 1631 K St., N.W., Washington 6, D.C. Check CP 5403 opposite last page.

To combat contamination . . .

UNION OIL USES HAMER



Main pump house manifold at Union Oil's Wilmington refinery uses hundreds of Hamer Line Blind Valves.

HAMER *Visible Shut-off* LINE BLIND VALVES

HAMER *Plug Valves*

Custom-crafted, Hamer Plugs welcome the tough applications where ordinary plug valves fall short. Standard dimensions. Readily installed.

With literally hundreds of different hydrocarbons moving through the refinery, Union Oil can't possibly risk product contamination. That's why they use Hamer Line Blinds. Hamer Line Blind Valves not only provide a permanent, positive leakproof shut-off, but are unsurpassed for long service-life and lasting safety. In addition Hamer Line Blinds are fast, simple to operate. One man can open or blind a line in one minute. Costly down time is reduced. Operational efficiency is vastly increased.

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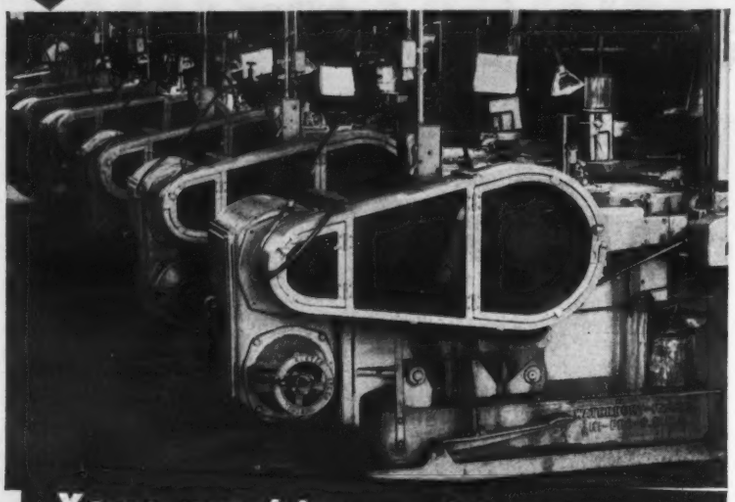
2919 Gardenia Ave., Long Beach 6, Calif.

Representatives throughout the World

When inquiring check CP 5404 opposite last page

REEVES Vari-Speed Motodrives provide the exact speeds required for maximum production and efficiency on this bank of six Waterbury-Farrel cold heading machine installation in the P. R. Mallory plant in Indianapolis.



Your machines will produce more at less cost with—

REEVES

Variable Speed Control

● Whether your production problems involve manual or *automatic operation* . . . REEVES complete line of Variable Speed Drives and Controls will deliver the exact speed required for each operation, each operator, under every changing condition of method or material. REEVES Speed Control is positive and accurate to a fraction of an RPM.

Let a REEVES Speed Control Engineer show you how you can make your machines . . . your operations . . . more efficient, more economical, more profitable—*now!* Write today for complete details. Specify CP16-L.

***Only* REEVES offers you a complete line of Variable Speed Drives and Automatic Controls!**

MOTODRIVE combines motor, speed varying mechanism and reduction gears in single, compact unit. Speed variations 2:1 to 6:1. Sizes to 40 hp. Also available in fractional sizes with 10:1 ratio.

VARI-SPEED MOTOR PULLEY converts any constant speed motor to an accurate, variable speed drive with 4:1 ratio. Rugged, dependable—Sizes to 15 hp. VARI-SPEED JR. available for light machinery.

VARIABLE SPEED TRANSMISSION for providing infinite, accurate speed flexibility over a wide range—2:1 to 16:1. Especially adaptable for heavy duty application. Fractional to 87 hp.

AUTO-PNEUMATIC CONTROL with linear output speeds is but one of a complete line of automatic controls designed and engineered to operate your machines more efficiently, more profitably, *automatically.*

REEVES PULLEY COMPANY • COLUMBUS, INDIANA

When inquiring check CP 5405 opposite last page

NEW LITERATURE

Analyzes role of combustion in smog problem

Current published data on relation of effluents of combustion processes to Los Angeles smog is summarized in 66-page report. Most of work done on problem has been carried out by either Stanford Research Institute or by Los Angeles County Air Pollution Control District. Report critically examines data, comments on conflicting information, and indicates where additional research is needed.

Findings reveal that largest quantities of air contaminants in the city originate with combustion processes. Practically only fuels burned in area are natural gas and fuel oil. Figures are cited on quantities consumed and amount of pollutants produced.

Also discussed is role of auto exhaust, diesel fuel, and refuse incineration. Report states that major contaminant of air in Los Angeles, on tonnage basis, is automobile exhaust. Total hydrocarbon emission from automobiles is in excess of 1000 tons per day.

To obtain "Combustion and Smog — Report 2" remit $3.00 direct to Southern California Air Pollution Foundation, Dept. CP, 704 South Spring Street, Los Angeles 14, California.

Productive maintenance tips for automation demands

Detailed information on organizing to meet demands that automation will make on electrical maintenance programs is provided in 18-page bulletin. Steps discussed include gathering equipment data, determining extent of routine maintenance, establishing a routine operating control system, evaluation for critical maintenance, and establishing a critical maintenance program.

Bul GEA-6087 is available from General Electric Co., Dept. CP, One River Road, Schenectady 5, N. Y. When inquiring specify CP 5406 on handy form opposite last page.

Mixers and blenders covered in three-color bulletin

Company's latest models of mixers and ribbon blenders are pictured and described in three-color, eight-page catalog. Specifications, dimensions, and features of all models are given. Equipment is designed for mixing powders, pastes, or liquids.

Bul 800 is issued by The J. H. Day Company, Incorporated, Dept. CP, 1144 Harrison Avenue, Cincinnati 22, Ohio. When inquiring specify CP 5407 on handy form opposite last page.

4 EASY STEPS TO BETTER PRODUCTION HEAT

1 Call in

the experienced Chromalox Electric Heating Specialist serving your area. He's as near as your phone.

2 Talk over

your heating plans and problems. You'll be given "case histories" of successful applications similar to your own.

3 Work out

the details of your application with the Chromalox Heating Specialist. Tell him what you want to accomplish in the way of results.

4 Follow Through

on the recommendations. Order the Chromalox Electric Heaters and controls needed for your application. You'll be more than pleased with the time, money and material saving results you'll get with Chromalox Electric Heat!

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CHROMALOX
ELECTRIC HEAT FOR MODERN INDUSTRY

When inquiring check CP 5408 opposite last page

Flotation unit's efficiency data given for various industries

Dissolved-air flotation unit designed to 1) capture raw materials for return to process, 2) replace or improve efficiency of existing methods of process solids separation, and 3) meet suspended solids and BOD demand standards, is described in illustrated eight-page publication. Unit is fed by its own pumping and air injection system, and has its own control network and retention tank.

Catalog features factual data on efficiency of Colloidair process, flow sheets of typical installations, description of operating principles, and an analysis by types of industries of various applications for the system. Twenty-three industries are listed.

Technical publication CS2 is issued by Bulkley, Dunton Processes, Inc., Dept. CP, 295 Madison Ave., New York 17, New York. When inquiring specify CP 5409 on handy form opposite last page.

Report on properties of Mylar film

Physical, chemical, and electrical properties, and adhesives developed for bonding the film, are described in two technical reports on Mylar. Bul TR-1 on properties contains revised information complete with charts, diagrams, and tables.

Information contained in report on adhesives, Bul TR-2, was supplied by adhesives manufacturers. Listed in detail are adhesives recommended for bonding Mylar to other films, foils, papers, and metals.

Technical Reports TR-1 and TR-2 are issued by Film Department, E. I. du Pont de Nemours & Co., Dept. CP, Nemours Bldg., Wilmington 98, Del. Check CP 5410, opposite last page.

Catalog describes three types of gages for remote liquid-level reading

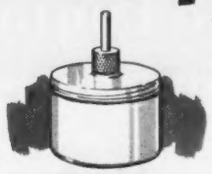
Design and construction features of three types of convex scale and flat scale remote reading gages are presented in eight-page catalog. Schematics and charts illustrate scales for specific needs. Information on visible and audible alarm systems is also given.

Cat No. 246 is issued by Jerguson Gage & Valve Co., Dept. CP, 80 Fellsway, Somerville 45, Mass. When inquiring specify CP 5411 on handy form opposite last page.

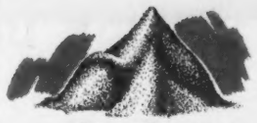
You name it-MOYNO® pumps it!

Foods
Potato salad, chow mein, peas, cream-style corn, tomatoes, molasses, chocolate.

Chemicals
Caustics, acids, dyes, petroleum solvents, soaps, sludges, latex, synthetic resins.



Pastes
Paper coating, starch, seam paste, size, adhesive dope, heavy grease, graphite sludge.



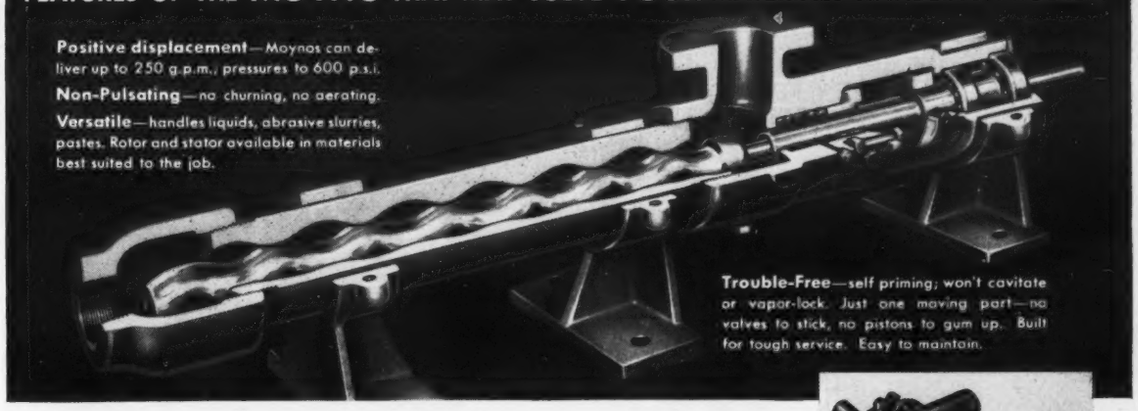
Abrasives
Insulator clay, frit, ground glass and water, porcelain glaze and enamel, cement, plaster.

FEATURES OF THE MOYNO THAT MAY SOLVE YOUR MATERIALS-HANDLING PROBLEM

Positive displacement—Moynos can deliver up to 250 g.p.m., pressures to 600 p.s.i.

Non-Pulsating—no churning, no aerating.

Versatile—handles liquids, abrasive slurries, pastes. Rotor and stator available in materials best suited to the job.



Trouble-Free—self priming; won't cavitate or vapor-lock. Just one moving part—no valves to stick, no pistons to gum up. Built for tough service. Easy to maintain.

R & M Moynos handle almost anything that can pass through a pipe

The Moyno is a problem-solving pump. And whether your problem is one of materials, maintenance or flow, there's a better-than-even chance that the Moyno is the pump you're looking for.

Here is a completely different kind of pump that handles almost anything that will push through a pipe, from free-flowing liquids to non-pourable pastes—even materials containing relatively large particles or abrasives.

This is how the Moyno works: a screw-like rotor turning within a double-threaded stator creates cavities which *progress* toward the discharge end of the pump, carrying the material being handled. The result is a smooth, steady flow, free from pulsation and turbulence.

The pumping elements of the Moyno are available in a wide range of materials, depending upon the substances to be pumped. From stainless steels and synthetic rubber to tool steels, bronze, plastics—there is a Moyno that will do the job you want, and do it with remarkable efficiency.

Industrial-type Moynos are available with capacities to 250 g.p.m.; pressures to 600 p.s.i. Small Moynos (see inset), used as original equipment, serve on washers, water pumps, sprayers, and many other products.

FREE...
this informative bulletin

Tell us your pumping problem—let's see how the Moyno can help solve it. If necessary, we'll be glad to run tests for you in our own laboratories. In any case, get the details on the Moyno—mail the coupon below.

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Propellair Industrial Ventilating Equipment

Robbins & Myers, Inc.
Pump Division, Springfield, Ohio (CP)
Please send Bulletin 30C on Moyno Pumps
Name _____ Title _____
Company _____
Address _____
City _____ State _____

When inquiring check CP 5412 opposite last page

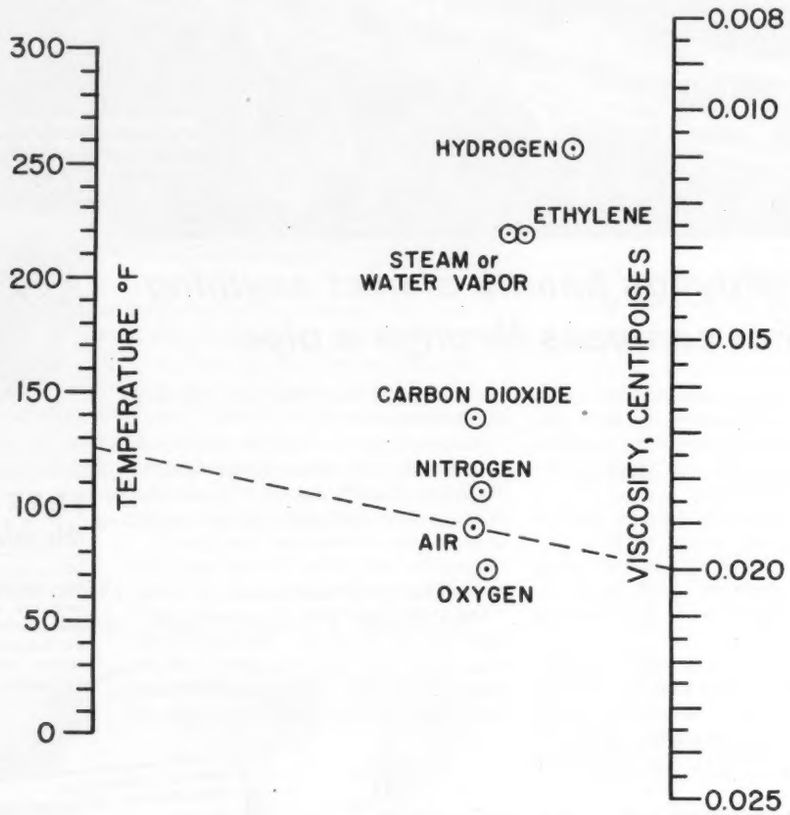
108

Viscosity of Gases

by GEORGE E. MAPSTONE & J. T. MUNDAY

Edited by D. S. DAVIS

This nomograph is used to find viscosity of gases in centipoises. As shown, for example, viscosity of air at 125°F is found by placing a straightedge through 125 on temperature scale and the proper point for air. Viscosity is seen to be 0.02cp.

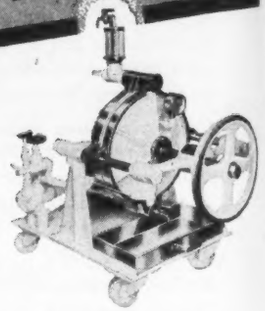


LITERATURE CITED

"*Gas Engineers' Handbook*," McGraw-Hill Book Co., p 121, (1934)

CUT HERE AND FILE

....Step Up your production with ERTEL ASBESTOS DISK FILTERS!

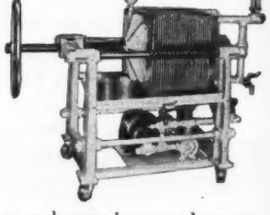


1. EBW MODEL PORTABLE FILTER

A highly efficient, readily portable filter that meets requirements for smaller capacities. Performance-proven over the years in many hundreds of plants throughout the world. Perhaps Ertel EBW model can economically speed up your production. Ask for full particulars — an EBW is in operation in your vicinity, right now!

2. ECD MODEL ENCLOSED DISK FILTER

Typical of Ertel craftsmanship is this Positive Seal Multi-Purpose Disk Filter. The outstanding feature of independent filtering elements provides positive seal of any type filtering medium. Cylinder prevents loss of liquid — particularly well adapted for volatile liquids as well as many other ordinary filtering requirements.



3. EU MODEL UTILITY FILTER

The Ertel Filter that's designed to use asbestos filter sheets, filter cloth, filter paper or filter cloth and filter aid. Standard units in bronze, nickel plated, stainless steel or hard rubber circulatory system. Comparison and operation records prove the EU Model unmatched in design, versatility and operation-life. Experience has shown that the great majority of filtration problems can be solved by your consultation with our engineers. May we help you?

ASK FOR ILLUSTRATED CATALOG

Describes the complete line of precision built Ertel Liquid Handling Equipment for Industry.

ERTEL ENGINEERING CORPORATION

KINGSTON 3, NEW YORK

Branch Office & Showroom Located in New York City

COMPLETE LINE OF *Liquid Handling Equipment*

ERTEL

When inquiring check CP 5413 opposite last page

Advantages of air power for control valves

Three fundamental kinds of air control valves are described and illustrated in 12-page booklet. Primary advantages of air power including speed, cleanliness, economy, resiliency, and lightness are explained. Diagrammatic drawings show clearly how air flows through valves and to operated cylinders.

Bul 101B is available from Dept. 1506, Ross Operating Valve Company, Dept. CP, 120 East Golden Gate, Detroit 3, Michigan. Check CP 5414 opposite last page.

Charts strength characteristics of 8 conveyor belt designs

Chart shows engineering data for standard conveyor belt constructions. Characteristics such as theoretical ultimate strength, actual ultimate strength, fastener strength, operating strength with fasteners, operating strength with splice, and troughing index are shown graphically on the chart.

Conveyor belt chart is issued by Belting Dept., Quaker Rubber Corp., Div. of H. K. Porter Co., Inc., Dept. CP, Tacony and Comly Streets, Philadelphia 24, Pa. When inquiring specify CP 5415 on handy form opposite last page.

Information on steam-water cycle deposits

As an aid to better understanding of analyses of steam-water cycle deposits, general information bulletin tabulates mineral name, chemical formula, usual areas in which deposits are found, normal causes, and some suggested preventive measures.

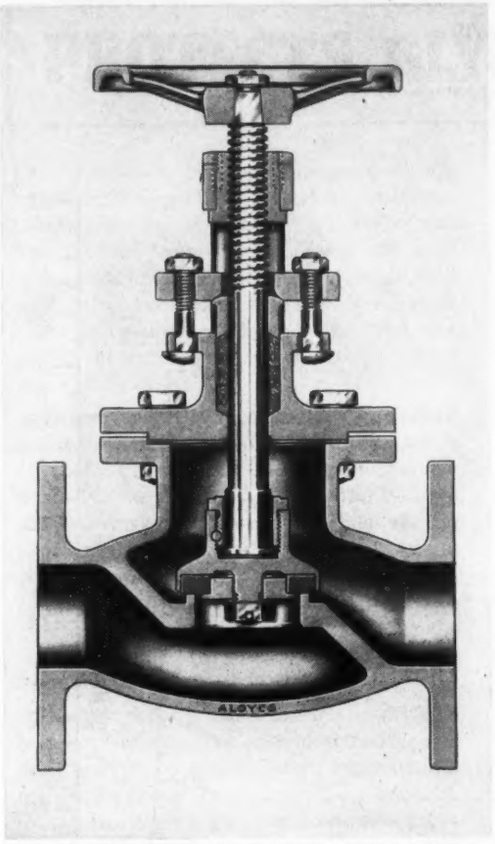
Bul 28X8155 is available from Allis-Chalmers Manufacturing Company, Dept. CP, 1151 S. 70th St., Milwaukee 1, Wis. When inquiring specify CP 5416 on handy form opposite last page.

Circular details specifications on interference filters

Data sheet shows typical transmission curve of multilayer interference filter used for spectrophotometry.

Tech Circular RD503 is issued by Baird Associates, Inc., Dept. CP, 33 University Rd., Cambridge 38, Mass. When inquiring specify CP 5417 on handy form opposite last page.

Aloyco valves with renewable Teflon discs out-last metal-to-metal seated valves



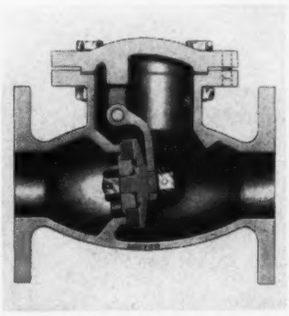
In handling volatile or elusive fluids, the slightest corrosion of a metal valve seating surface or packing gland is bound to cause leakage.

With Teflon discs, however, this leakage is prevented because of Teflon's ability – even when adjoining metal is slightly corroded – to form a gas-tight seal under compression. Add to this the fact that Teflon discs and seats are renewable when worn and you can see why we're using them in so many Aloyco valves.

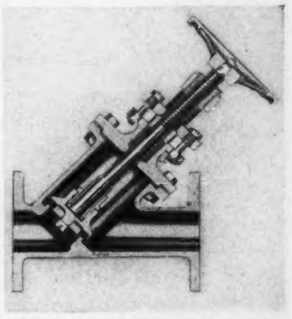
Teflon, the new DuPont plastic, has outstanding resistance to virtually all corrosive chemicals up to 550° F. It's used as bonnet gasket, packing and seating material in many Aloyco valves specially designed and constructed to take advantage of its remarkable properties.

You can specify Teflon in plain or jacketed, screwed end or flanged Globe, Y, Angle, Swing Check, Needle, Plug Gate or Sampling valves in a variety of alloys and sizes. Send coupon for details.

ALOYCO GLOBE VALVE features special holder for renewable Teflon disc to prevent force-out even under heavy overloads.



ALOYCO SWING CHECK VALVE offers greater seat tightness for tighter closing and longer life with renewable Teflon disc.



ALOYCO Y VALVE is easier to maintain and repair, thanks to Teflon disc. Also readies this valve for vacuum service. 5.4

Alloy Steel Products Company, Inc.
1302 West Elizabeth Avenue
Linden, New Jersey

Gentlemen:

I am interested in Aloyco jacketed valves. Please send me a free copy of your Bulletin No. 6.

Name_____

Firm_____

Address_____

City_____ **Zone**_____ **State**_____

Longer Lasting
ALOYCO
VALVES
1ST IN CORROSIVE SERVICE

When inquiring check CP 5418 opposite last page

Density of Waste Sulfite Liquor

by D. S. DAVIS

Professor of Chemical Engineering
Viriginia Poytechnic Institute

Recent data[2] enable correlation of density of waste sulfite liquor with temperature by means of the equation

$$\log (120 - \rho) = a + bt$$

where:

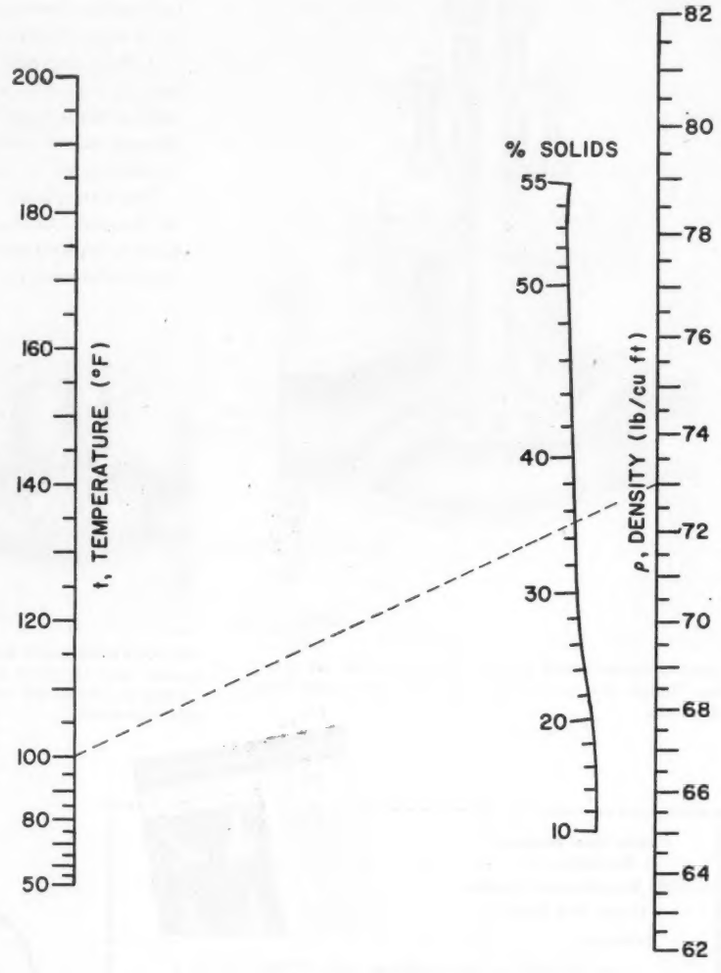
ρ = density lb/cu ft
t = temperature °F

This relationship is the basis of nomograph presented here and constructed by well-known methods[1].

Typical Example

What is the density of waste sulfite liquor at 100°F when concentration of solids is 32.5%?

Connect 100 on t-scale with 32.5 on solids scale with a straight line. Intersection with density scale shows that density is 73 pounds per cubic foot.

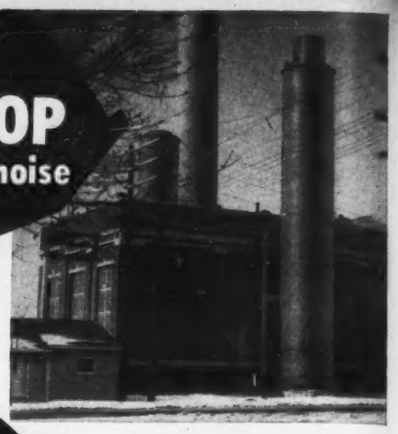


LITERATURE CITED

(1) DAVIS, D. S., *"Empirical Equation and Nomography,"* Chapter IX, McGraw-Hill Book Co. (1943)

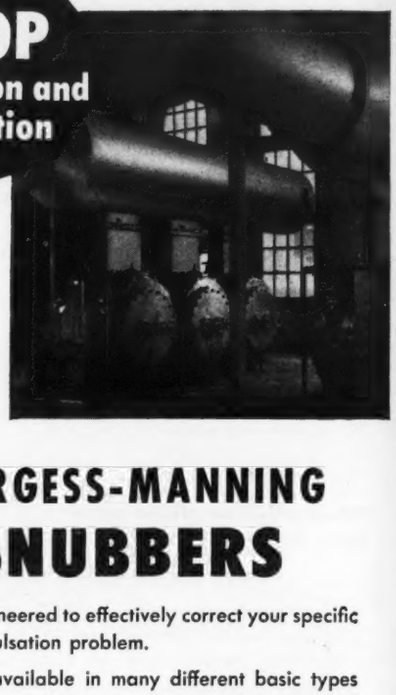
(2) HUNTER et al, *Tappi*, Vol 36, No. 11, p 493 (1953)

Here's How to STOP that noise



from air, steam and other gas discharges

and STOP Pulsation and Vibration



in gas and air piping

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BURGESS-MANNING SNUBBERS

— are engineered to effectively correct your specific noise or pulsation problem.

They are available in many different basic types for arresting intake and exhaust noises, some of which may integrally incorporate such additional features as air cleaning—or heat recovery—or spark arresting—or surge control—or water separating.

Others, which are primarily designed to stop line surges set up by compressors, pumps, blowers, etc., will effect noteworthy savings in piping, repairs and maintenance, and permit accurate flow readings.

There is no obligation for recommendations. Send us a description of your problem.

BURGESS-MANNING COMPANY
Sound Engineering 721 East Park Avenue, Libertyville, Illinois
Dallas Chicago

When inquiring check CP 5419 opposite last page

Storage tank fabrication and data featured

Material specifications, tank design data, foundation recommendations, accessories and fittings, computing tables for size and capacity, welding procedures, testing methods, and information on all kinds of storage tanks and general steel plate construction are included in 24-page illustrated catalog. Photos show examples of every kind of storage tank designed and erected by company.

Cat 54B is available from Hammond Iron Works, Dept. CP, 630 Fifth Ave., New York 20, N. Y. When inquiring specify CP 5420 on handy form opposite last page.

Handy selector for flanges and couplings revised

Revised edition of Flange and Coupling Selector is in same easy-to-read slide rule form. Side of selector devoted to flange sizes list such relevant facts as OD of flange, thickness, OD of raised face, No. of holes, diameter of holes, diameter of bolts, bolt circle — for Series 15 and 30 flanges.

Coupling selector shows average sizes of standard, extra heavy, 3000- and 6000-pound couplings. A convenient pipe standard table is incorporated on the selector, showing nominal wall thicknesses for schedules No. 10 to 160 as well as nominal thicknesses and weight per foot for standard, extra heavy, and double heavy pipe.

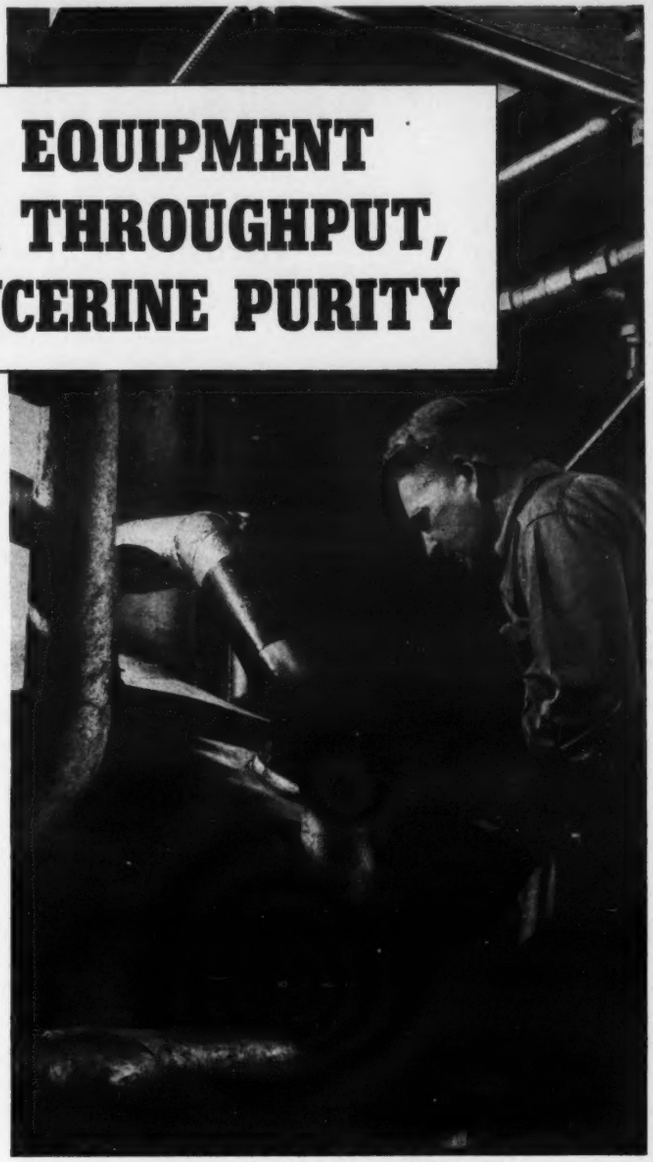
Flange and Coupling Selector is available on letterhead request to the Nooter Corporation, Dept. CP, 1400 S. Second St., St. Louis 4, Mo.

Test methods, procedures for fatty acids

Reference list of 20 pages is intended to assist with terms and values employed in dealing with commercial fatty acids and related fatty derivatives. It points the way to sources of widely accepted practical methods for assessing product properties, uniformity, or performance. Listing covers following tests: acid value, ash, color, iodine value, saponification value, titer, unsaponifiable, hydroxyl value, and polyunsaturated acids, as well as some methods or terms of more limited usefulness.

"Fatty Acid Tests and Terms" is issued by Association of American Soap & Glycerine Producers, Inc., Dept. CP, 295 Madison Ave., New York 17, N.Y. When inquiring reader may simply check CP 5421 on handy form opposite last page.

CLAD STEEL EQUIPMENT HELPS TRIPLE THROUGHPUT, PROTECTS GLYCERINE PURITY



Multiple distillation was eliminated with this new corrosion-resistant clad steel still.

Even after slow and costly distillation, this soapmaker was plagued by poor quality "yellow distilled" glycerine. Then a new distillation unit was designed featuring a still pot with solid nickel coils for faster heating, nickel-clad steel shell for vital corrosion resistance. Results: redistillation eliminated, throughput tripled, and a 70% cut in fuel costs which saved $7,000 a year.

The advanced design of this new equipment called for both the performance and economy of clad steel. Nickel cladding, inseparably bonded to the lower cost carbon-steel backing, does the work of expensive, solid high alloy in plate form at substantial savings. Clad's corrosion resistance protects the product *economically*, assuring that it will be pure and free from contamination. Important also, the still has the strength needed to withstand high vacuum operation.

Equipment performance like this results from teamwork between the equipment builder and design and production engineers. Are you looking for maximum productivity . . . low-cost, trouble-free operation . . . and long equipment life? You'll find that sound engineering and modern fabrication techniques employing versatile clad steels can provide these advantages for you. It pays to consult your fabricators *early* in your planning. They will work with your engineers and consultants, can often provide cost-saving suggestions in giving you the specialized equipment you want.

Ask one of your fabricators to show you the new Lukens clad steel movie, "Equip for New Profits." Here—in full color and sound—are factual accounts of how clad steel equipment brings new economies. Its story contains ideas of interest to everyone concerned with production efficiency and economy. Or contact Manager, Marketing Service, Lukens Steel Company, 750 Lukens Building, Coatesville, Pa.

LUKENS

CLAD STEELS

STAINLESS-CLAD · NICKEL-CLAD · INCONEL-CLAD · MONEL-CLAD

PRODUCER OF THE WIDEST RANGE OF TYPES AND SIZES OF CLAD STEELS AVAILABLE ANYWHERE

When inquiring check CP 5422 opposite last page

Viscosity of Starch Solutions

National Starch Products, Inc.

Nomograph by BRUCE FADER, Associate Editor

Carboxymethyl starches (CM starches) have properties depending on chemical composition. Cohesiveness, clarity, solubility, stability and, above all, viscosity can be altered by chemical preparation. While tailor-made CM starches are available on request, three standard grades are available from stock.

This nomograph has been prepared to show relationship of concentration and temperature to viscosity for these three standard CM starches. Average figures are given.

Grade	Viscosity Rating	Per cent soln to give water 100 centipoise visc at 77°C (170°F)
CM Starch HH	high	1
CM Starch MH	medium	2.5
CM Starch LH	low	12

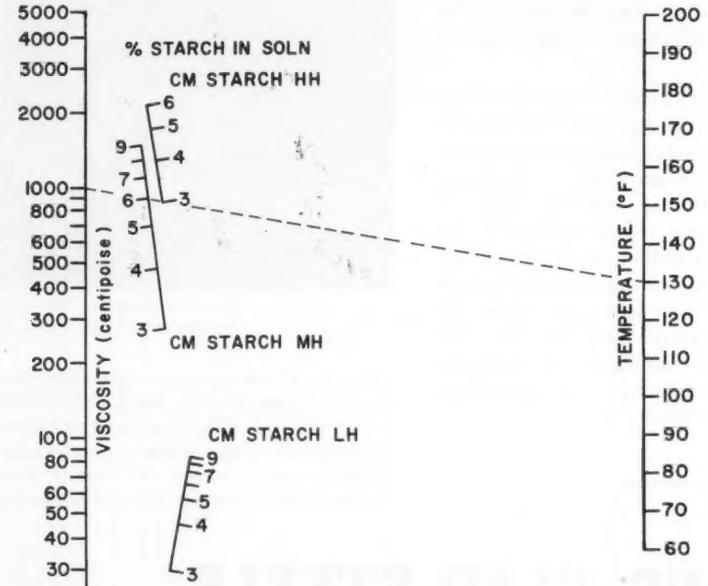
Typical Example

To prepare a water solution of CM Starch which will have a viscosity of 1000 centipoise at 130°F, which grade of starch should be used? How much?

Connect 1000 centipoise with 130°F. Note that straight line intersects both HH and MH grade scales. If grade HH is used, a 3% solution will have the proper viscosity; if grade MH is used, 6% will be required.

Detailed information including a series of plots of viscosity, other properties, and methods of use are included in a six-page bulletin.

Bul 226 is issued by National Starch Products, Inc., Dept. CP, 270 Madison Ave., New York 16, N.Y. . . . or for more information check CP 5423 on handy form opposite last page.



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small gate valves?

need small 600 lb. gate valves?
only PACIFIC can offer this selection!

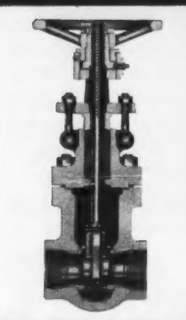


fig. no. 3651
o. s. & y., bolted bonnet gate valve. a premium valve available in a wide choice of trim materials and recommended where a full port opening is required.

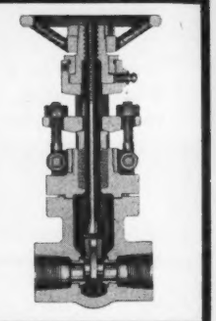


fig. no. 595
o. s. & y., bolted bonnet gate valve. comparable to fig. no. 3651 but somewhat more economical and its use is suggested where a full port opening is not essential.

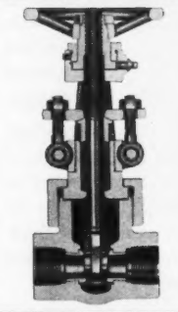


fig. no. 55
o. s. & y., union bonnet gate valve. an economical valve for those that prefer the compactness and dismantling features of the union bonnet construction.

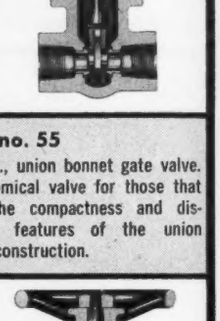


fig. no. 65
inside screw, union bonnet gate. a low cost compact valve for use where space and weight are important and where a full port opening is not required.

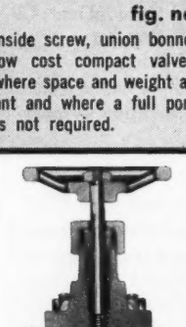


fig. no. 695
inside screw, bolted bonnet gate. the "competitor" to meet the tightest cost budget, yet offering the bolted-on bonnet feature. comparable to fig. no. 65.

write or phone today for additional information on these valves and on PACIFIC's entire line of corrosion resistant valves.

sales offices in all principal cities

PACIFIC VALVES, INC.

3201 walnut avenue, long beach 7, calif.
phones long beach: l. b. 40-4541; los angeles: nevada 6-2325

"earning a good name in every industry"

When inquiring check CP 5424 opposite last page

Case histories highlight demister report

Construction and performance of wire mesh entrainment separators are reviewed in four-page brochure. Photographs, tables, and charts describe various applications, and operating characteristics.

Included are case histories from chemical, petroleum, and petrochemical industries, showing how demisters have cut overhead losses, improved quality of products, and permitted higher vapor velocities.

"Performance of Wire Mesh Demisters" is issued by Otto H. York Company, Inc., Dept. CP, 6 Central Avenue, West Orange, N. J. Check CP 5425 on handy form opposite last page.

Economy of operation provided by air driven hydraulic pump

Information on design, installation, and operation of economical, air-driven hydraulic pump is included in data sheet. Photos, sectional and dimensional drawings supplement text.

Data Sheet 36 is available from The Aldrich Pump Company, Dept. CP, 23 Gordon St., Allentown, Pa. Check CP 5426 opposite last page.

Labels last when coated with resistant varnish

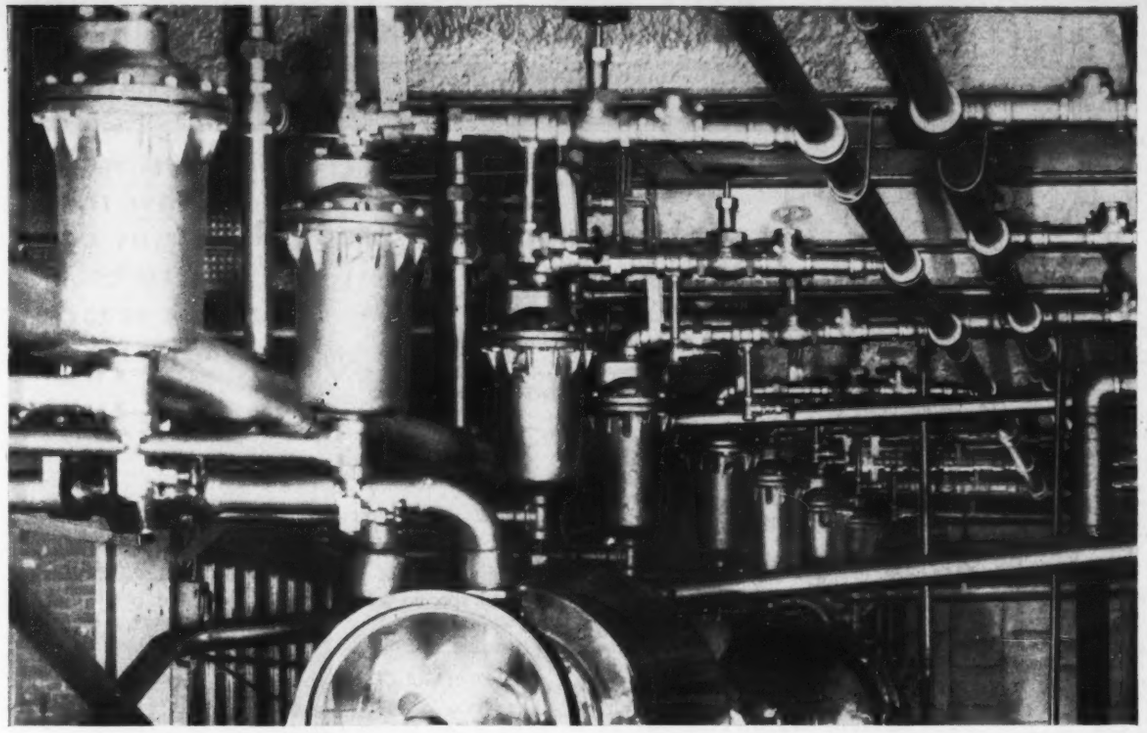
Two label varnishes, one for general laboratory and industrial plant use and the other for protection against corrosive chemicals, are described in eight-page bulletin. Application charts indicate which varnish should be used on labels to protect from various materials.

Bulletin on label varnish is available from The Varniton Company, Dept. CP, 416 N. Varney Street, Burbank, California. When inquiring specify CP 5427 on handy form opposite last page.

Describes non-crazing cleaner for polystyrene materials

How polystyrene can be cleaned without crazing is described in data sheet. Material discussed is a solvent liquid cleaner specifically formulated for removing unwanted lacquer, grease, and mold lubricants from polystyrene materials without marring surface of plastic.

Data sheet on Poly-Kleen is issued on letterhead request to Schwartz Chemical Co., Inc., Dept. CP, 326 W. 70th St., New York, N. Y.



How To Increase Production and Still Use Less Fuel!

Problem—Cooking kettles at National Cranberry Company, South Hanson, Mass., couldn't produce enough to supply three recently speeded up canning lines. There was neither enough space nor steam supply capacity to add more kettles. Might there be another answer?

Solution—Mr. Russell Appling, Production Manager, made a very logical move, with everything to gain and nothing to lose. He called his local Armstrong Representative to talk about re-trapping his set-up. The existing traps were replaced with Armstrong 2" No. 216 large vent traps, one on each of the 8 kettles. Additionally, the steam lines were trapped to assure a dry steam supply.

Results—30% more kettle production. A fourth canning line was added to keep up with output. And, fuel consumption dropped 30% despite the production increase!

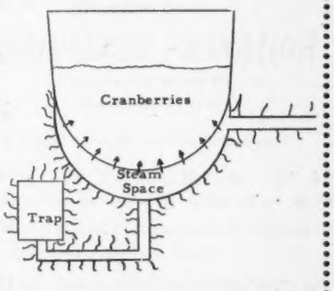
If you want more efficient production, greater return on equipment investment, why not call *your* Armstrong Representative. See your classified phone directory or Thomas Register, or write:

ARMSTRONG MACHINE WORKS
880 Maple Street, Three Rivers, Michigan

Application Engineered **Ask for Steamtrap Book**

ARMSTRONG STEAM TRAPS

HOW A KETTLE CAN GIVE 30% MORE OUTPUT WITH 30% LESS FUEL



Assume that with trap "X", inadequate for the job, cooking time is 10 minutes. During that period heat is radiating (wavy lines) from supply lines, kettle and trap. This non-productive heat loss wastes steam. Now, with an Armstrong trap keeping the steam space free of air and condensate, heat transfer rate is fast and cooking is done in 6 minutes. Thus, four minutes of non-productive radiation loss is eliminated—the faster cooking actually saves steam.

When inquiring check CP 5428 opposite last page

Pvt Relationships for Freon-11

By ROBERT L. BREHM

Edited by D. S. DAVIS

Professor of Chemical Engineering
Virginia Polytechnic Institute

Pressure-Volume-Temperature relationships for superheated Freon-11 (Trichloromonofluoromethane)[1] can be expressed by the equation where

$$V = \frac{t + 460 - 2.066P + 0.00392P^2}{13.84P^{0.9592} - 1.0}$$

V = specific volume, cu ft/lb
t = temperature, °F
P = pressure, psia

Connect 300 of the t-cale with 1.2 of the P-scale.

This nomograph, constructed by methods previously described[2], provides rapid, accurate solution of the equation.

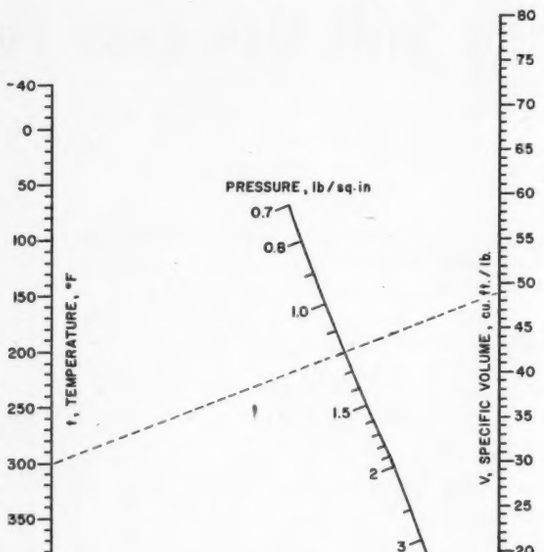
Typical Example

What is the specific volume of Freon-11 at 300°F and a pressure of 1.2 psia?

Connect 300 of the t-scale with 1.2 of the P-scale. Read specific volume as 49.0 cubic feet per pound.

LITERATURE CITED

(1) PERRY, J. H., *"Chemical Engineers' Handbook,"* 3rd Ed, 6 260, McGraw-Hill Book Co., New York, (1950)
(2) DAVIS, D. S., *"Empirical Equations and Nomography,"* Chapter IX, McGraw-Hill Book Co., New York, (1943)



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FREE BULLETIN tells How to Solve High Temperature Thread Problems! PREVENT GALLING and SEIZING OF STUDS at Temperatures up to 1800°F!

✓ Prevents Stud Breakage
✓ Eliminates Pitting of Stainless Steel
✓ Reduces Torque
✓ Speeds Disassembly Time

C-5 FEL-PRO "HI-TEMP" ANTI-SEIZE THREAD COMPOUND

Fel-Pro's exclusive C-5 colloidal-copper formula "copper-plates" metal, prevents locking, galling and direct contact between thread assemblies even at 1800°F without breakdown! And C-5 is safe for all metals!

Prevents galvanic pitting even where dissimilar metals are joined! Protects all threaded surfaces of bolts, plugs and studs, insuring their repeated re-use. WRITE TODAY FOR FREE BULLETIN! 837

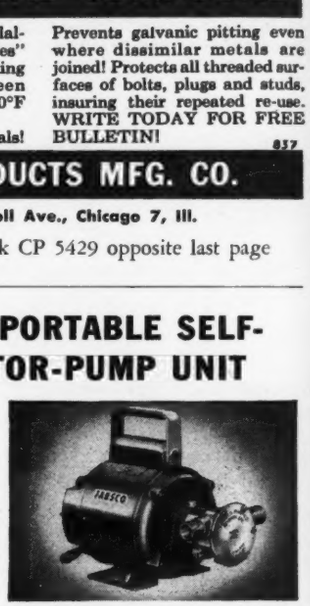
FELT PRODUCTS MFG. CO.

1515 Carroll Ave., Chicago 7, Ill.

When inquiring check CP 5429 opposite last page

NEW JABSCO PORTABLE SELF-PRIMING MOTOR-PUMP UNIT

Weighs only 29 lbs.
List Price $58.50



Jabsco announces the immediate availability of the outstanding Model 2187 Portable Motor-Pump Unit, *with capacity of 600 GPH at 10′ head.* Satisfied users find this versatile unit solves many pumping needs in industrial, farming, plumbing and marine uses. Model 2187 pumps coolants, circulates and transfers liquids, returns spilled liquids to process, drains cellars and sumps, pumps waste water to sewer, pumps out flooded basements, cesspools, and many other vital uses. Model 2187 is equipped with a close-coupled Jabsco bronze Pump with mechanical seal. Ports are threaded for standard ¾″ external garden hose connections, with ½″ IPS optional upon request. Heavy duty capacitor type ¼ HP Wagner electric motor with overload protector powers the unit. Motor is rated at 1725 RPM, 60 cycles—115 volts A.C. Comes with 6 ft. cord with ground wire and plug. Form-fitting handle folds away for easy storage. Also available at additional cost, D.C. motor units, 32 volt and 110 volt. Model 2187 is ready for instant use, and requires no additional equipment. No lubrication is required, no contamination of liquid pumped. Instantly self-priming with dry suction lifts to 15′, up to 25′ primed. For complete information, write **Jabsco Pump Company,** 2031 North Lincoln Street, Burbank, California.

When inquiring check CP 5430 opposite last page

Presents information on carbon blacks for protective, decorative coatings

Properties, uses, and selection of the various carbon blacks for protective and decorative coatings are presented in 61-page notebook. Methods of handling, dispersion data, and a detailed discussion of common problems encountered are given, as is a description of the history and manufacture of these Columbian Carbon Company blacks.

"Carbon Blacks for Protective and Decorative Coatings" is available to formulators and technologists on letterhead request to Binney & Smith Inc., Dept. CP, 380 Madison Ave., New York 17, N.Y.

Explains portable test instruments for electrolytic conductivity

Information about portable indicators for electrolytic conductivity measurements in both plant and laboratory is presented in four-page data sheet. Publication describes use of these indicators for measuring purity of condensate and various other solutions, sugar ash, and the conductivity of soil and soil extracts. Photographs and circuit diagrams illustrate design and operating features.

Data Sheet E-95(1) is issued by Leeds & Northrup Co., Dept. CP, 4934 Stenton Ave., Philadelphia 44, Pa. Check CP 5431 opposite last page.

Coupling handles misalignments of all kinds

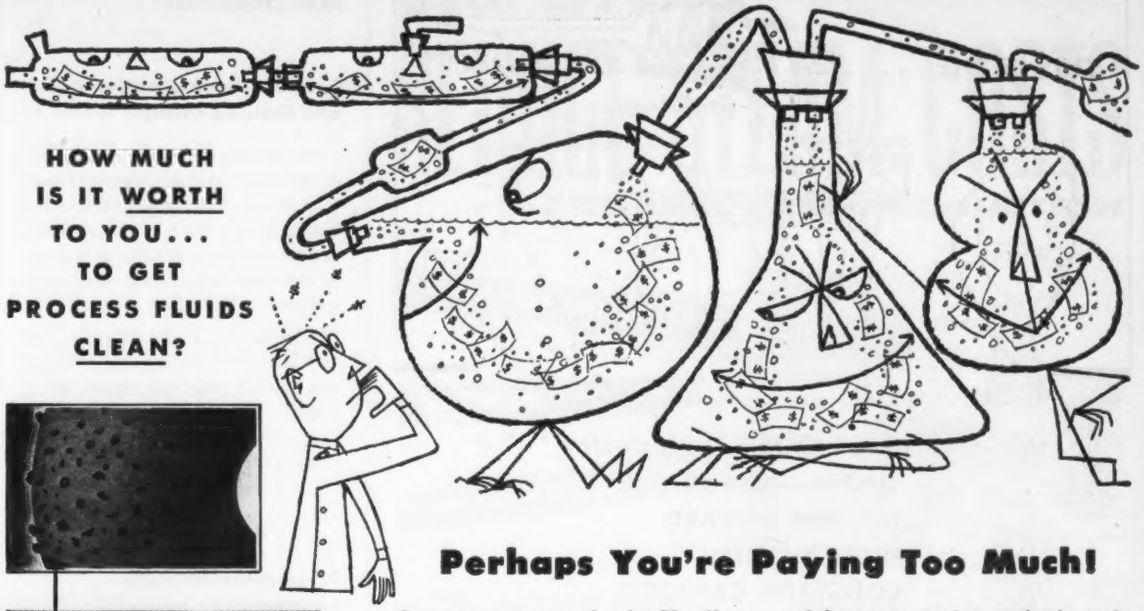
Automatic centrifugal clutch coupling which features the ability to handle misalignments of all kinds is described and illustrated in eight-page bulletin. Unit is said to improve starting conditions and provide smooth acceleration on drives for high-inertia equipment.

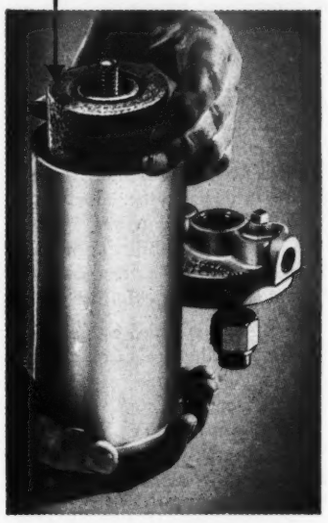
Bul CE-3 is available from The Hilliard Corp., Dept. CP, Elmira, N.Y. When inquiring specify CP 5432 on handy form opposite last page.

Individual requirements met by open-head drum rings

Variety of drum rings and closing tools designed for faster, surer closing of full open-head drums, are described and illustrated in 16-page bulletin.

Bulletin on drum rings is issued by Drum Parts, Inc., Dept. CP, 10311 Meech Ave., Cleveland 5, Ohio. Check CP 5433 opposite last page.





*10, 25, 50 micron densities available
MICRO-KLEAN cartridges fit other makes; special lengths available for built-in installations.

Perhaps You're Paying Too Much!

Sometimes, it's worth a *lot*. You'll go to any expense to remove contamination.

But—in hundreds of cases, chemical firms are getting perfectly satisfactory results with the less expensive Cuno MICRO-KLEAN replaceable-cartridge filter.

SO YOU HAVE TO ASK YOURSELF . . .

1. *Will the* MICRO-KLEAN *do my job well enough?*

To help you answer: Cuno MICRO-KLEAN is guaranteed to remove all solids larger than specified* plus a large proportion down to 1 micron.

2. How much will the MICRO-KLEAN save me?

Well, the savings come from:

a. Lower initial cost
b. Lower maintenance cost—housing easily disassembled for cleaning—filter renewed by simple replacement of cartridges.
c. Lower replacement cost—MICRO-KLEAN's exclusive construction assures double life.
d. Positive mechanical separation—cartridge cannot shrink, swell, channel, or distort—fluid is protected.

INVESTIGATE MICRO-KLEAN NOW! This well-proved filter handles wide ranges of fluids at wide ranges of flow rates and viscosities . . . capacities from a few to over 800 gpm . . . connections from ⅜ in. IPS to 6 in. flanged.

CUNO

Complete Line
ENGINEERED FILTRATION
If you can pump it, Cuno can filter it

MICRONIC (Micro-Klean) • DISC-TYPE (Auto-Klean) • WIRE-WOUND (Flo-Klean)

WHAT'S YOUR CLEANING PROBLEM? SEE IF MICRO-KLEAN WON'T SOLVE IT FOR A FRACTION OF THE COST

☐ Absorption oils
☐ Cellulose acetate
☐ Chlorinated solvents
☐ Coal tar solvents
☐ Enamels
☐ Ethylene glycol
☐ Ethyl and methyl cellulose
☐ Glacial acetic acid
☐ Helium
☐ Industrial alcohols
☐ Lacquers
☐ Natural gas
☐ Nitrogen
☐ Paraffin
☐ Petroleum solvents
☐ Photographic developing solutions
☐ Pickling brines
☐ Sulphuric acid (up to 12%)
☐ Varnishes
☐ Water and water solutions

OTHERS .....

PLEASE ATTACH COUPON TO YOUR BUSINESS LETTERHEAD

CUNO ENGINEERING CORPORATION Dept. 162
102 South Vine Street, Meriden, Conn.

Please send me a free copy of your MICRO-KLEAN bulletin. I am especially interested in the services checked.

Name.....Title.....

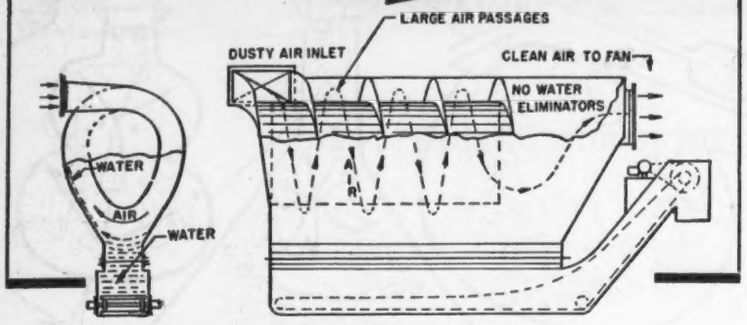
Company.....

Address.....

City.....State.....

When inquiring check CP 5434 opposite last page

THIS IS THE .... Air Tumbler



the master of **DUST** *in industry* * * *

SIMPLE—DEPENDABLE
NO FIRE HAZARD
HIGH EFFICIENCY
CONSTANT CAPACITY
LOW OPERATING COST

Write for Bulletin No. 531. Address:

DUST SUPPRESSION & ENGINEERING COMPANY

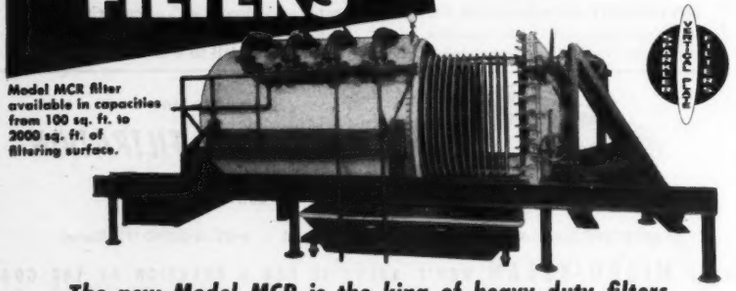
P. O. BOX 67, LAKE ORION, MICHIGAN

Agents in all principal U. S. cities

When inquiring check CP 5435 opposite last page

SPARKLER FILTERS

Heavy Duty Model MCR



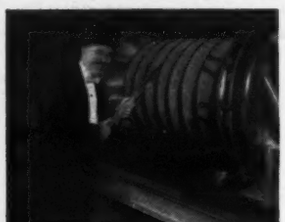
Model MCR filter available in capacities from 100 sq. ft. to 2000 sq. ft. of filtering surface.

The new Model MCR is the king of heavy duty filters

Heavy residue products are handled with ease and the cake can be discarded in a semi-dry state. If you haven't seen this filter operate it is hard to believe how fast and easy it is to open and clean. One lever releases all head bolts simultaneously. One switch control gives a smooth power retraction of the tank exposing the plates for convenient cleaning. The complete opening is accomplished in less than one minute.

Everywhere the MCR filter has been installed filtering costs have dropped materially. And the daily production output increased as much as 300% as reported by one brewery using the MCR for primary filtration of beer.

Ask for proof of this amazing new economy in filtration with your product.



Operating and cleaning the MCR is a white collar job.

Write Mr. Eric Anderson for personal service

SPARKLER MANUFACTURING CO.
MUNDELEIN, ILL., U. S. A.
Sparkler International Ltd. • Plants at Galt, Ontario, Canada, Amsterdam, Holland

When inquiring check CP 5436 opposite last page

NEW LITERATURE

Catalogs books, posters, and films on safety

Occupational safety services of National Safety Council are outlined in 52-page, four-color brochure. Booklet lists films, posters, publications, and other aids for supervisor and employe training.

Service Guide 2.1 is issued by National Safety Council, Dept. CP, 425 N. Michigan Ave., Chicago, Ill. When inquiring specify CP 5437 on handy form opposite last page.

Gives technical data on propylene oxide

Information sheet of four pages presents physical properties, specifications, shipping data, constant boiling mixtures, physiological properties, and uses of propylene oxide. Besides use as an intermediate, the compound has high solvent power and is an effective stabilizer in the manufacture of products from resins containing chlorine.

Bul F-8485 is issued by Carbide & Carbon Chemicals Co., a Div. of Union Carbide & Carbon Corp., Dept. CP, 30 E. 42nd St., New York 17, N.Y. When inquiring specify CP 5438 on handy form opposite last page.

Compounding of colored butyl rubber goods

Hi-Sil 202 in compounding white or colored butyl rubber compounds is the subject of 16-page digest-size reprint. Processing and compounding are covered in the bulletin.

"The Compounding of Colored Butyl Rubber Goods" is issued by Columbia-Southern Chemical Corp., Subsidiary of Pittsburgh Plate Glass Co., Dept. CP, 420 Ft. Duquesne Blvd., Pittsburgh 22, Pa. When inquiring specify CP 5439 on handy form opposite last page.

Get low cost, trouble-free general purpose valves . . .

***ZERO* to 150 p.s.i.**
Temperatures to 250°F.

Atkomatic

Semi-Direct Lift Solenoid Valve

• Packless, full-ported valves for general purpose industrial use. Operate from 150 p.s.i. down to 0 p.s.i.—temperature to 250°F. Low current consumption. Instantaneous, stick-free operation. Parabolic shaped disc screw prevents water hammer effect, assures minimum drop in pressure through valve.

Simple yet rugged construction of cast bronze is ideal for air, gas, freon, methyl chloride, water, oil, *low pressure steam* or other media not harmful to bronze. Write today for complete information and prices. Specify CP1-104

Atkomatic **VALVE COMPANY**

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When inquiring check CP 5440 opposite last page

RM RESISTANT MATERIALS

Specialists in all
RESISTANT PIPING MATERIALS
to your specifications

Exclusive National Sales Agents for American Hard Rubber Company's

ACE PARIAN
(Polyethylene Plastic)
CHEMICAL PIPING

Perfect combination—Ray Miller's knowledge of corrosion-resistant products and American Hard Rubber Company's century of experience! Ace Parian is a tough, odorless, non-toxic Polyethylene compound—light weight and excellent impact strength even at sub-zero temperatures. Rigid piping ½" to 2"; large line of fittings and valves specifically designed to meet the requirements of the paper, pharmaceutical, food, beverage, plating and chemical processing industries. Write for bulletin.

Territories Available for Distributors and Sales Agents — Inquiries invited

RAY MILLER CO.
4240 KANAWHA TPK., SO. CHARLESTON, W. VA.

When inquiring check CP 5441 opposite last page

F.D.I.

COMPLETE DATA SHEET FILE ON

PRESSURE SYSTEM PROTECTION WITH FRANGIBLE DISCS

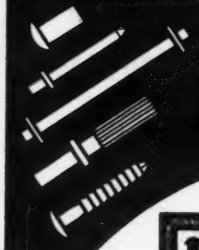
With more than 25 years' experience in applying known scientific principles to pressure protection together with carefully supervised experimental work, our engineers have acquired a wealth of highly specialized knowledge in the field of metal behavior.

We offer this information to you as a continuing data sheet file. It's free! Write for it today!

FRANGIBLE DISCS, INC.
PENNS GROVE, N. J.

When inquiring check CP 5442 opposite last page

CORROSION RESISTANT



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STAINLESS STEEL
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COPPER ALLOYS
SILICON BRONZE
ALUMINUM
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Established 1850

Hassall fasteners are cold headed for maximum strength, lowest cost.

Special fasteners of all types, in any metal are a HASSALL specialty. Small as well as large quantities economically produced. The use of special cold forged parts may cut your parts cost and reduce your assembly cost.

We have a variety of raw material in stock. Our delivery is fast. If you have a fastening problem, tell us about it . . . we may have the answer.

JOHN HASSALL, INC. P.O. Box 2196 Westbury, Long Island, New York

When inquiring check CP 5443 opposite last page

Helps in selection of nickel steels

Over 70 mechanical property charts included in 36-page bulletin show properties which may be regularly expected in nickel alloy steels in various section sizes. General characteristics of each type are briefly described as an aid in the selection of steels for particular applications.

Bul A-68 is issued by International Nickel Company, Inc., Dept. CP, 67 Wall St., New York 5, N. Y. When inquiring specify CP 5444 on handy form opposite last page.

Trouble savers for V-belts

Clear and simple explanation of what to look for when a V-belt drive doesn't deliver maximum rpm is included in two-page folder. It graphically illustrates the right and wrong way of applying V-belts, making it easy to spot and identify troubles at glance. This is the first of a series of five Trouble Savers intended to help users of V-belt drives to diagnose common causes of trouble in their drives.

Mailer V-1400-M39 is available from Worthington Corporation, Dept. CP, Harrison and Worthington Ave., Harrison, N. J. Check CP 5445 opposite last page.

Catalog contains 8 pages about vacuum gages

Ionization and thermocouple gages for measuring vacuums are illustrated and described in eight-page catalog composed of three data sheets.

"Vacuum Gages" is issued by Naresco Equipment Corp., Dept. CP, 160 Charlemont St., Newton Highlands 61, Mass. Check CP 5446 opposite last page.

NEW WAY TO

REDUCE STEAM COSTS

AND INCREASE PRODUCTION

LOWEST MAINTENANCE!
GREATER CAPACITY!
EXTRA RUGGED!

☐ Here is a new steam trap that meets all operating conditions!

The Strong Hydro-Flex Steam Trap performs efficiently under light loads yet gives the same high standard of performance under heavy flow, also greater discharge capacity when needed.

We guarantee your steam system will improve with Hydro-Flex. Outstanding plus-features include: a dual fulcrum arrangement that snaps the valve wide open to give unrestricted condensate flow, all stainless steel working parts including one piece deep-drawn stainless steel bucket. The rugged construction features of Hydro-Flex provide long service life with minimum maintenance.

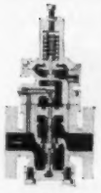
Your local Strong distributor will give you complete information or write us for Bulletin No. SS-40.

STRONG, CARLISLE & HAMMOND COMPANY
1392 W. 3RD. STREET • CLEVELAND 13, OHIO

STRONG
HYDRO-FLEX high efficiency under all condensate loads
STEAM TRAPS

HORIZONTAL TYPE SERIES
Hydro-Flex traps with horizontal inlet have the same features as bottom inlet types.

Available from over 200 industrial distributors in the United States, Canada and Foreign Countries.



3 types available for wide range application . . . to meet pressure and capacity requirements.

PRESSURE REGULATING VALVES

are custom sized for job demands. Bolted body permits non-threaded seats and wide selection of seat sizes.

BLOW-DOWN VALVES

STRONG STRAINERS
Offer maximum protection from dirt, scale or sediment. Available in semi steel, cast steel and bronze.

When inquiring check CP 5447 opposite last page

One Mill Group Bought 4000 ROTARY UNIONS*

Type S ROTARY UNION

After making comparative tests, one mill group standardized on ROTARY UNIONS and purchased 4000 . . . 18 months ago. These 4000 ROTARY UNIONS have since been operating 16 to 24 hours a day . . . without adjustments or mechanical maintenance and with practically no replacements.

There are 40 standard types and sizes of the ROTARY UNION, for applications such as Steam up to 150 PSI, Hot Oil to 500°, Coolants, Air, Gases, Water, Brine, and Alternate Mixtures at speeds up to 1000 RPM. Direct factory engineers are available at all offices to recommend the proper ROTARY UNION for your specifications. Contact our nearest office for consultation or write Dept. 2C for catalog.

"Where *Good Connections* Count" ®

* Trade Name—Patented

PERFECTING SERVICE CO.
332 Atando Ave. Charlotte, N. C.
(Home Office & Factory)
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New York
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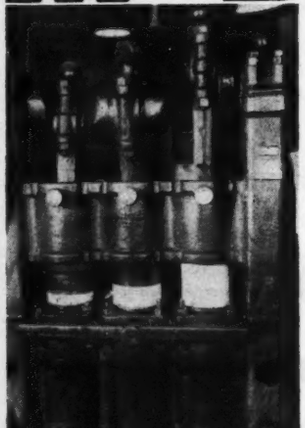
When inquiring check CP 5448 opposite last page

McDANEL



ASKS YOU—HAVE YOU THOUGHT OF CERAMICS FOR THAT TOUGH APPLICATION?

Much tougher than Steel

TOLERANCES .0005" OR CLOSER!

● Has metal failed to stand up under erosion, corrosion, friction, high temperature? Try ceramics. High strength ceramic parts break all records for long service, such as the ceramic pump pistons shown here. McDanel specializes in special ceramic parts, shapes, mixes, bodies, and dies. Most ceramic manufacturers steer away from "specials," but "Specials Are Our Specialty." Sketch your idea and send it to us. Your inquiry is special to McDanel.

McDANEL Industrial PORCELAINS

McDANEL
REFRACTORY PORCELAIN COMPANY
BEAVER FALLS · PENNA.

Write for your McDANEL Industrial Ceramic Catalog today!

When inquiring check CP 5449 opposite last page

NEW LITERATURE

Covers heating systems and steam specialties

Five major steam heating systems, with and without control, and a full line of valves, traps and steam power specialties are described in condensed 20-page catalog.

Featured is an automatically-controlled high vacuum steam heating system that adjusts its heat output and fuel consumption to outdoor temperature and heat loss conditions.

Bul 110 is issued by Illinois Engineering Company, a division of American Air Filter Company, Inc., Dept. CP, 2035 S. Racine Ave., Chicago 8, Ill. Check CP 5450 opp. last page.

Digests wide range of lab apparatus

Illustrated 16-page catalog details wide scope of apparatus, instruments and other laboratory materials suitable for testing, research, and control laboratories. Included are such articles as ultraviolet sources, stop clocks, portable refrigeration systems, hot plates, heaters, stirrers, and stainless steel laboratory ware.

Bul 541 is issued by A. Daigger & Co., Dept. CP, 159 W. Kinzie St., Chicago 10, Ill. Check CP 5451 opposite last page.

Ethylene glycol data

Easy-to-read tables and charts show constant boiling mixtures, specific gravity relationships, vapor pressures, viscosities, and other physical properties of ethylene glycol. Shipping data, physiological properties, and uses are presented.

Bul F-8327 is issued by Carbide & Carbon Chemicals Co., a Div. of Union Carbide & Carbon Corp., Dept. CP, 30 E. 42nd St., New York 17, N.Y. Check CP 5452 opposite last page.

for CHEMICALLY RESISTANT **JARS, POTS CROCKS, TANKS**

Insist On **U. S. CHEMICAL PORCELAIN**

Jars, pots, tanks, etc. made from "U.S." Chemical Porcelain are leak-proof, mechanically strong, dense and of virtual *zero* porosity. They are completely inert to all chemicals except hydrofluoric acid and hot caustics. And porcelain contains *no iron* to be absorbed — no induced contamination! Its non-aging characteristics make for long, maintenance-free service life. No-seam construction, rounded corners and smooth lustrous white glazed surfaces provide for quick, easy cleaning.

Our complete Chemical Porcelain line of jars, pots and tanks includes a wide variety of stock items in capacities ranging from 2½ to 200 gals.

WRITE TODAY — *ask for* BULLETIN 410

U.S. STONEWARE *Process Equipment Div.*
Akron 9, Ohio 241 D

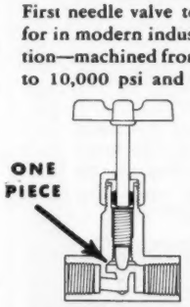
When inquiring check CP 5453 opposite last page

New **MARSH** *Needle Valves*

MAXIMUM WORKING PRESSURE 10,000 PSI

. . . for finer regulation of water, oil or gas

First needle valve to combine all the characteristics called for in modern industry. Embodies sturdiest basic construction—machined from solid bar stock—suitable for pressures to 10,000 psi and equally efficient in lower range. Note stem guide fused to body by new "Conoweld" process, eliminating faults of conventional two-piece valves. Stem 416 stainless steel. Stem threads fine pitch for strength and micrometer regulation. Body electro-zinc plated. Sizes ⅛" to 1", globe and angle patterns.



Ask for new Needle Valve Catalog

MARSH INSTRUMENT CO. *Sales Affiliate of Jas. P. Marsh Corp.* **Dpt. Z, Skokie, Ill.**

When inquiring check CP 5454 opposite last page

Two bulletins cover heat transfer and scraped surface exchangers

Company's heat transfer equipment and scraped-surface exchangers are described and illustrated in two bulletins. First bulletin, HE-6, covers heat transfer equipment including exchangers, components and accessories. Photos illustrate steps in manufacture and typical installations.

Second bulletin, PE-1, is devoted to scraped-surface exchangers. Typical installations are illustrated. Details of construction are shown in drawings.

Buls HE-6 and PE-1 are available from Henry Vogt Machine Co., Dept. CP, 10th & Ormsby Sts., Louisville 10, Ky. When inquiring reader may simply check CP 5455 on handy form opposite last page.

Protects drums from products, products from contamination

Three series of linings for steel drums are described in four-page bulletin. Kinds of linings include phenolic, vinyl, and heavy-duty vinyl plastisol. How these linings are applied and what materials they will withstand are also covered. Brief case histories supplement descriptive material.

Form DL-2 is issued by United Chromium, Incorporated, Dept. CP, 100 E. 42nd St., New York 17, N.Y. When inquiring specify CP 5456 on handy form opposite last page.

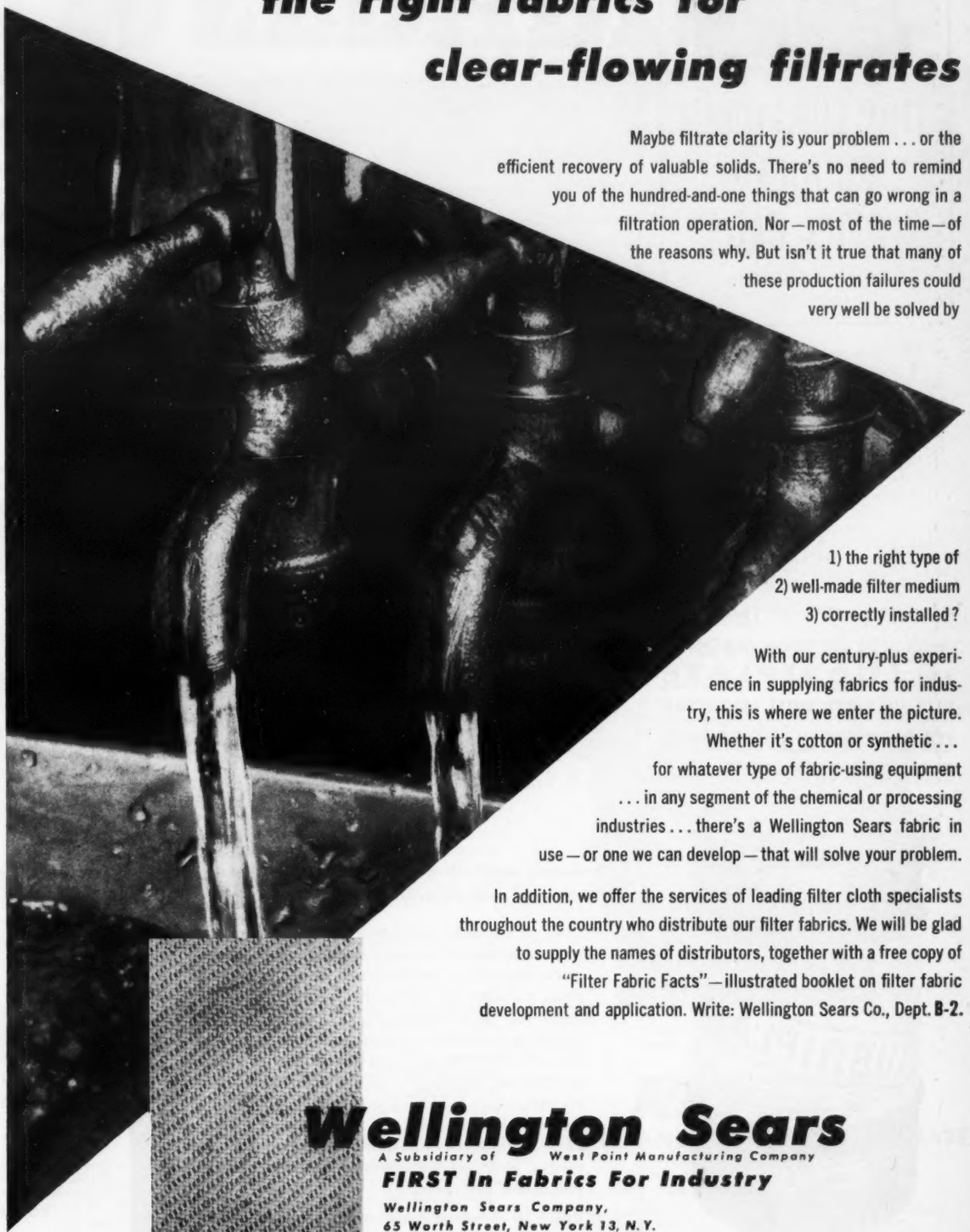
Gives results on use of bentonite as coagulant for waste waters

Use of bentonite as a coagulant for industrial waste treatment is reported in two-page bulletin. Results obtained in processing effluent water from coal and blast furnaces flue dust washing operations are discussed.

The addition of 2.5 to 4 parts of the colloidal mineral to 10,000 parts of coal suspension (containing large quantities of minus 325 mesh coal) resulted in a rapid-settling coagulated mass after three minutes of mixing and five to seven minutes of settling. Addition of 1.5 parts to 10,000 parts of flue dust suspension produced coagulation with settling in about seven minutes. Treatment of distillery, citrus, and other wastes is also mentioned.

Bul 234-R is issued by American Colloid Company, Dept. CP, Merchandise Mart Plaza, Chicago 54, Ill. When inquiring reader may simply check CP 5457 on the convenient Reader Service slip which is located opposite last page.

How to get the right fabrics for clear-flowing filtrates



Maybe filtrate clarity is your problem . . . or the efficient recovery of valuable solids. There's no need to remind you of the hundred-and-one things that can go wrong in a filtration operation. Nor—most of the time—of the reasons why. But isn't it true that many of these production failures could very well be solved by

1) the right type of
2) well-made filter medium
3) correctly installed?

With our century-plus experience in supplying fabrics for industry, this is where we enter the picture. Whether it's cotton or synthetic . . . for whatever type of fabric-using equipment . . . in any segment of the chemical or processing industries . . . there's a Wellington Sears fabric in use—or one we can develop—that will solve your problem.

In addition, we offer the services of leading filter cloth specialists throughout the country who distribute our filter fabrics. We will be glad to supply the names of distributors, together with a free copy of "Filter Fabric Facts"—illustrated booklet on filter fabric development and application. Write: Wellington Sears Co., Dept. B-2.

Wellington Sears

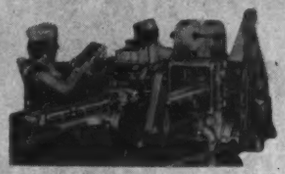
A Subsidiary of West Point Manufacturing Company

FIRST In Fabrics For Industry

Wellington Sears Company,
65 Worth Street, New York 13, N.Y.

Offices in: Atlanta • Boston • Chicago • Dallas • Detroit • Los Angeles • Philadelphia • San Francisco • St. Louis

When inquiring check CP 5458 opposite last page



"THIS LUBRICANT REDUCES SERVICE CALLS"

—says LYNCH CORPORATION
Toledo, Ohio

"LUBRIPLATE greatly reduces unnecessary wear and prolongs the life of machines. It has reduced customer calls for service to a minimum. Our Service Engineers can readily spot machines that have had other than LUBRIPLATE Lubrication, as these machines do not give the service they should."

For nearest LUBRIPLATE distributor, see Classified Telephone Directory. Send for free 56-page "LUBRIPLATE DATA BOOK"... a valuable treatise on lubrication. Write LUBRIPLATE DIVISION, Fiske Brothers Refining Co., Newark 5, N. J. or Toledo 5, Ohio.

REGARDLESS OF THE SIZE AND TYPE OF YOUR MACHINERY, LUBRIPLATE LUBRICANTS WILL IMPROVE ITS OPERATION AND REDUCE MAINTENANCE COSTS.

When inquiring check CP 5459 opposite last page

NEW LITERATURE

Gives data on small size swivel fittings

Company's line of small size ball bearing swivel fittings ranging in size from ⅜ to 1" and from working pressures of 6000 psi at 225°F to 1250 psi at 750°F is described in four-page bulletin. Method of construction and application of these fittings as well as complete dimensions, specifications, and other engineering data are included. Sectional drawings illustrate text.

Cat FS-107 is available from Emsco Manufacturing Company, Dept. CP, P. O. Box 2098, Terminal Annex, Los Angeles 54, Calif. When inquiring reader may simply check CP 5460 on the convenient Reader Service slip which is located opposite last page.

Polyamide-epoxy resin compositions listed

Outstanding flexibility, alkali resistance, high resistance to solvents and chemicals, water-, oil-, and grease-resistance, and good adhesion are some of the characteristics of Polyamide Resin 100-epoxy resin thermosetting compositions. Processing, properties, uses, and handling information are included in eight-page bulletin. Three pages of tables show suggested formulations and comparison of final properties.

Bul 11-4-2 is issued by Chemical Div., General Mills, Inc., Dept. CP, Kankakee, Ill. When ininquiring reader may simply check CP 5461 on the convenient Reader Service slip which is located opposite last page.

Pressure measuring elements illustrated and described

Line of pressure instruments designed for direct measurement, remote transmission and automatic control, is described and illustrated in 24-page publication. High pressure helical element for pressures to 80,000 psi, as well as diaphragm, bellows, spiral and standard helicals covering ranges from ten inches of water to 6000 psi, are diagrammed and explained. Exact ranges are listed for each material and each element. Bulletin also describes case and linkage features, lists charts for standard process ranges, and covers accessories such as seals and pulsation dampeners.

Bul 6-10 is issued by The Foxboro Co., Dept. CP, 174 Neponset Ave., Foxboro, Mass. When inquiring reader may simply check CP 5462 on handy form opposite last page.

Save Time and Money on Tower Packings

Specify KNOX for initial installations as well as replacements

Raschig Ring

Single-Partition Ring

Cross-Partition Ring

- KNOX produces porcelain tower packings from the same composition as is used for high voltage electric porcelains.
- Resists high temperatures, fumes, vapors, corrosion, liquids, alkalies and acids.
- Non-porous — complete vitrification firing 2300°F. provides zero porosity.
- Modern production techniques and over 30 years "KNOW HOW."
- Wide range of designs.
- Uniform quality — high chemical purity — iron free — great mechanical strength.

If you're interested in Better Tower Packings at lower Operating Cost, we'll be glad to send more information, prices and samples on request.

Double Spiral Ring

Triple Spiral Ring

Berl Saddle

Here's other additions to the popular KNOX line for the Chemical Industry.

Porcelain Jet Rings Patent Pending

Porcelain Carboy Bungs and Neoprene Washers

Porcelain Balls

NOTE: We also manufacture Special Porcelain Items for the Chemical Industry — send Drawings or Samples for Quotation†.

MANUFACTURED BY
KNOX PORCELAIN CORPORATION
KNOXVILLE 1, TENNESSEE

When inquiring check CP 5463 opposite last page

...ANSWERS INDUSTRY'S PROBLEM OF FLEXIBLE HOSE THAT WILL... 1. Stand Up Under Temperatures Up to 2000° F.
2. Carry Corrosive Gases.
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PROCESSES, EQUIPMENT and MATERIALS

Use this "quick-locator" when you want information on a specific type of process, equipment or material mentioned in the processing stories or the advertisements in this magazine. Everything discussed in this issue is given here, if you want more data you can write manufacturer direct . . . or turn to last page and use the handy "Information Request Slip." This is a special service provided by the publisher . . . no obligation or charge, of course. The publisher contacts the proper manufacturers for you—information comes to you direct.

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One of many advantages of 90/10 Cupro-Nickel

WELDABILITY

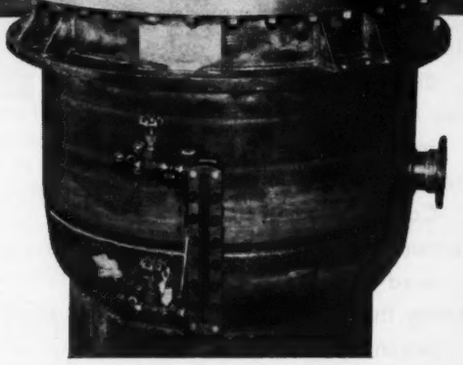
Welding head on filter shell

One of the relatively new copper base alloys is 90/10 Cupro-Nickel, which is coming into increased use as a result of experience with it. Revere offers it in sheet and plate, pipe and tube. It is highly resistant to corrosion and erosion, particularly in salt or brackish water. In addition it can be cold or hot worked, welded, soldered and polished. Because its nickel content is less than the older 70/30 alloy, it is priced lower.

The item shown here is a 90/10 Cupro-Nickel filter for aviation gasoline, designed and fabricated by the Warner Lewis Company, Division of Fram Corporation, Tulsa, Oklahoma, for the U. S. Navy. Heads and shell are 1⅛" thick. Revere was given the opportunity to collaborate with the Warner Lewis manufacturers on welding, which was successfully accomplished by the metallic arc process, using Inco 70/30 Cupro-Nickel electrodes. The vertical weld on the shell was X-rayed 100% and found satisfactory to pass Navy inspection. Because of the thickness of the metal, it was decided to form the heads hot at around 1690° F. The forming was done by the Hackney Iron & Steel Co., Enid, Okla., which also consulted with Revere.

Warner Lewis Company of Tulsa, with representatives in 30 cities, are specializing on all types of alloy design and fabrication and inquiries of this nature are invited.

If you wish information regarding the selection, welding, or working of copper and its alloys and aluminum alloys, see the nearest Revere Sales Office.



Completed aviation gasoline filter, made of 90/10 Cupro-Nickel

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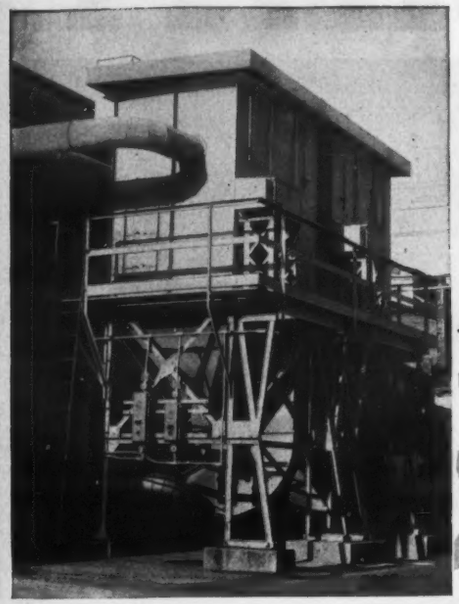
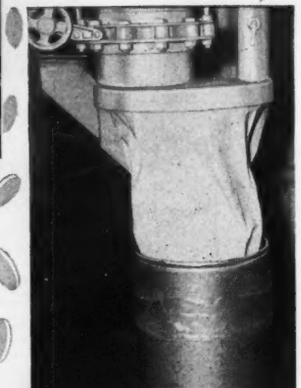


Sly Dust Filter at the plant of Merck & Co., Inc., Rahway, New Jersey.

SLY KEEPS VITAMIN PLANT DUST-FREE



Packaging Unit showing exhaust duct connected to Sly Dust Filter.

Merck & Co., Inc. uses Sly Dust Filters to maintain quality of product and manufacturing efficiency in the processing of vitamin mixtures.

The final ground powders are blended, milled, sifted and subdivided. Dust tends to escape from each operation. By the use of proper hooding of dust sources the dust is drawn into Sly Dust Collector. About 1.10 to 1.25 percent of each mixture is recovered and reused.

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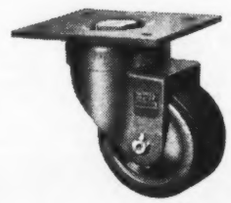

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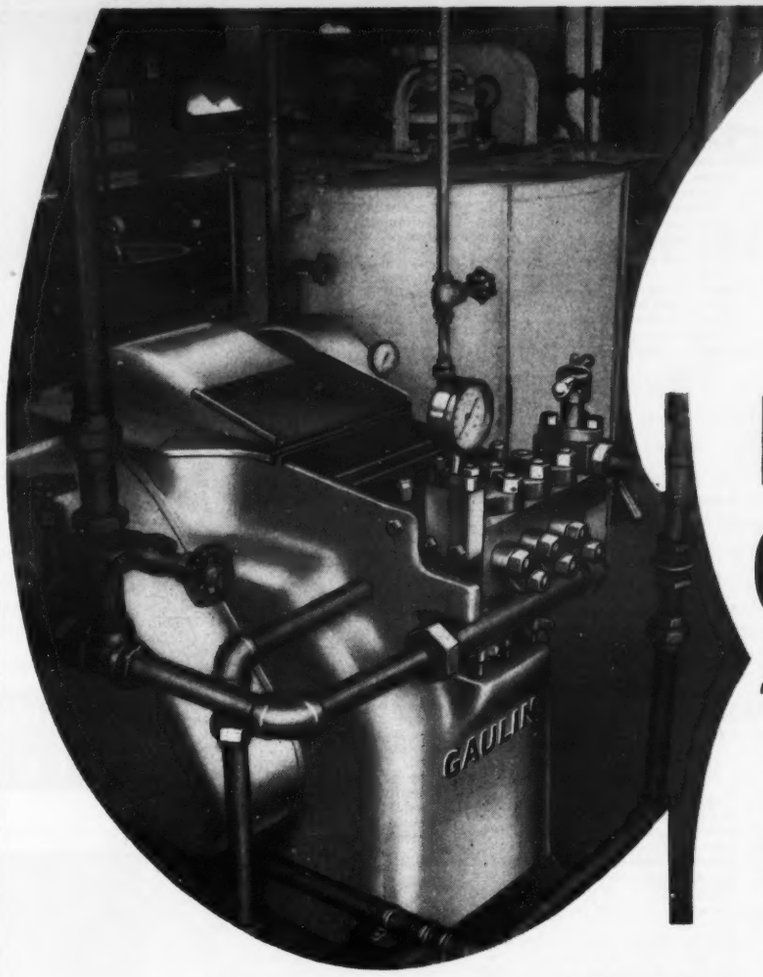

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R-21

RICHMOND MANUFACTURING COMPANY

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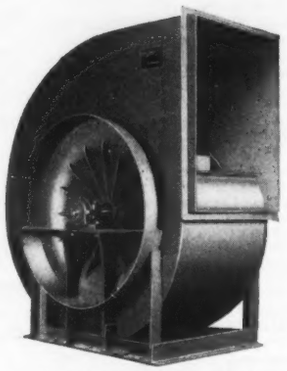

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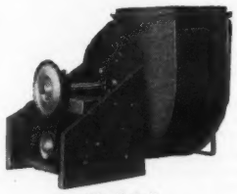

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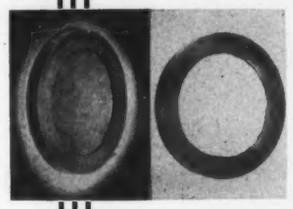

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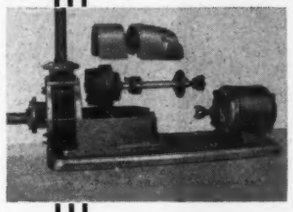

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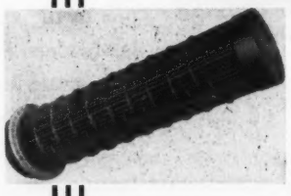

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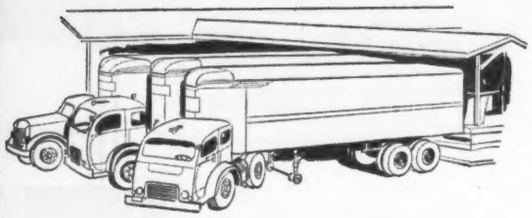

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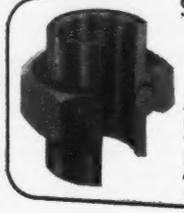

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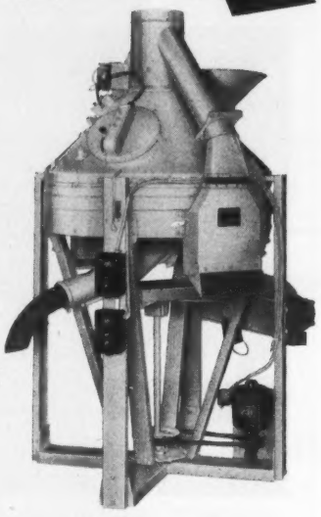

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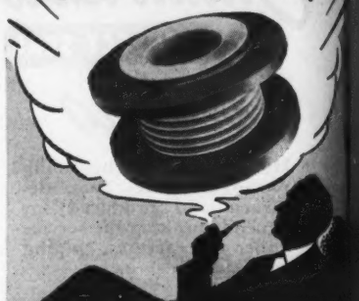

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☐	4964b	Ethylene Glycol
☐	4964c	Triethylene Glycol
☐	4964d	Ethylene Oxide
☐	4965	Industrial & Laboratory Chemicals
☐	4966	Emulsion Vehicle for Paints
☐	4967	Alginates
☐	4968	Behenic Acid
☐	4969	Paraformaldehyde
☐	4970	Sodium Phosphate
☐	4971	Silicone Gum
☐	4972	Fungicides
☐	4973	Silica Gel
☐	4974	Brinemaker
☐	4975	Vegetable Oils
☐	4976	Monochlorobenzene
☐	4977	Ethylene Cyanohydrin
☐	4978	Stabilizer for PVC
☐	4979	Nucleic Acid
☐	4980a	Fertilizer Chemicals
☐	4980b	Methionine
☐	4980c	Metallic Sodium
☐	4980d	Technical Developments (State Number)
☐	4981	Vinyl Acetate Polymers & Copolymers (State Application)
☐	4982	Sulfur Dioxide
☐	4983	Performance of Exterior Coatings
☐	4984	Plastic Finish
☐	4985	Micron-size MoS_2 Powder
☐	4986	Scorch Retarder
☐	4987	Tagged Amino Acids
☐	4988	Crystal Urea (State Application)
☐	4989	PVC Resins
☐	4990	Rubber-to-Metal Adhesives
☐	4991	Alumina
☐	4992	Coconut Oil Fatty Acids & Methyl Esters
☐	4993	Petroleum Chemicals
☐	4994	Adsorbent and Catalyst
☐	4995a	Hydrogenated Tallow
☐	4995b	Chemilats
☐	4996	Mineral Filler
☐	4997	Emulsifiable Polyethylene
☐	4998	Molybdic Oxide
☐	4999	Polyamide Resin
☐	5000	Couplings & Reducers
☐	5001	Mechanical Seal
☐	5002	Homogenization
☐	5003	Detergent Manufacturing Process
☐	5004	Vacuum Rotary Dryer
☐	5005	Industrial Wipers
☐	5006	Cooling Tower Tests
☐	5007	Dust Control & Recovery
☐	5008	Water Pollution
☐	5009a	Heat Exchanger
☐	5009b	Pressure Vessels
☐	5010	Storage Batteries
☐	5011	Ion Exchange in Plating Field
☐	5012	Long Glass Fiber Insulation
☐	5013	Load Cells
☐	5014	Flow Alarm
☐	5015	Preservatives
☐	5016	Teflon Braid Packing
☐	5017	Plastic Hose
☐	5018	Plastic Tubing
☐	5019	Temperature Controller
☐	5020	Waxed Chart Paper
☐	5021	Lubricant
☐	5022	Filter Presses
☐	5023	Employe Relations
☐	5024	Liquid Meter
☐	5025	Temperature Indicator
☐	5026	Refuse Disposal Truck
☐	5027	Controlled-volume Pump
☐	5028	Butterfly Valve
☐	5029	Spray Nozzles
☐	5030	Oxygen Steelmaking
☐	5031	Steam Generator
☐	5032	Glass Screens
☐	5033	Package PVC Plants
☐	5034	Filter Aids
☐	5035	Automatic HotMill
☐	5036	Automatic Proportioning Weighing System
☐	5037	Oxygen-combustibles Analyzer-recorder
☐	5038	Instrument Panel
☐	5039	Thermocouples
☐	5040	Pressure Controllers
☐	5041	Temperature & Humidity Control
☐	5042	Temperature Indicator
☐	5043	Specific Gravity Indicator
☐	5044	Stack Wind Controller
☐	5045	Flow Integrator
☐	5046a	Feeder (State Problem)
☐	5046b	"Waste Treatment Guide"
☐	5047	Temperature Indicator-Controller
☐	5048	Infrared Cells
☐	5049	Photometer
☐	5050	Proportioning Pump
☐	5051	Controlled-volume Pump
☐	5052	Moisture Register (State Requirement)
☐	5053	pH Control
☐	5054	Volumetric Load-measuring Elements
☐	5055	Liquid Meters (See coupon)
☐	5056	Pipe Surface Thermometer
☐	5057	Silent Check Valve
☐	5058	Density Gage
☐	5059	Air-operated Controller
☐	5060	Proportioning Control
☐	5061	Recorders
☐	5062a	Gas Analyzer
☐	5062b	Gas Alarm System
☐	5062c	Oxygen Analyzer
☐	5063	Pressure Transmitter
☐	5064	Speed Controller
☐	5065	Dew Point Control
☐	5066	Dial Thermometer
☐	5067	Pressure & Vacuum Controller
☐	5068	Pyrometer
☐	5069	Liquid Flow Meter & Control
☐	5070	Volt-amp Recorder
☐	5071	Mass Spectrometers
☐	5072a	Infrared Plant Stream Analyzer
☐	5072b	Analytical Control Application
☐	5073	Steam-jacketed Valve
☐	5074	Teflon Mechanical Seal
☐	5075	pH Meter
☐	5076	Stratis Tin
☐	5077a	Water Soluble Gum
☐	5077b	Starch Products
☐	5078	Corrosion-resistant Valves
☐	5079	Slurry Pump
☐	5080	Conveyors
☐	5081a	Tank Weighing
☐	5081b	Crane Scale
☐	5082	Bulk Material Bins
☐	5083	Bagging Scale
☐	5084	Drum Rack
☐	5085	Belt Conveyor
☐	5086	Gas Transport
☐	5087	Small Parts Hopper
☐	5088	Fork Trucks
☐	5089	Natural-frequency Conveyor
☐	5090	Industrial Storage Bins
☐	5091	Self-unloading Bulk Truck
☐	5092	Lift Trucks
☐	5093	Tractor Starting System
☐	5094	Air-conveying System
☐	5095	Materials Handling Equipment
☐	5096	Pallet Stacker
☐	5097	Air-conditioned Crane
☐	5098	Filters & Strainers
☐	5099	Metal Fabrication
☐	5100	Switching Conveyor
☐	5101	Steel Loading Ramps
☐	5102	Material Handling System
☐	5103	Hoist Loader
☐	5104	Adjustable Loading Ramp
☐	5105	Auto-Scoop Loader
☐	5106	Box Car Loader
☐	5107	Magnetic Conveyor
☐	5108	Portable Drum Dumper
☐	5109	Shaft-mounted Drive
☐	5110	Plastic Tote Pan
☐	5111	Pneumatic Conveyors
☐	5112	Tractor Shovel
☐	5113	Nylon Chain
☐	5114	Corrosion-resistant Coatings
☐	5115	Polyvinyl Chloride
☐	5115A	Polyvinyl Chloride Ducts
☐	5116	Cyclone Separator
☐	5117a	Reactor
☐	5117b	Receiver
☐	5117c	Condenser
☐	5117d	Evaporator
☐	5117e	Storage Tank
☐	5118a	Pumps
☐	5118b	Pipe & Fittings
☐	5118c	Heat Exchangers
☐	5118d	Cascade Coolers
☐	5118e	HCl Absorbers
☐	5119	Neoprene Coatings
☐	5120	Globe & Check Valves
☐	5121	Vinyl Coating
☐	5122	Rubber Lining Repair
☐	5123	Chemical-resistant Cement
☐	5124	Stainless Processing Equipment
☐	5125	Plug Valve
☐	5126	Cupro-nickel Alloys
☐	5127	Hydraulic Piston Seal
☐	5128	Corrosion-resistant Pipe, Valves & Fittings
☐	5129	Wrought Iron Pipe
☐	5130	Fluorocarbon Plastic
☐	5131	Epon Coating
☐	5131A	Epon Coating
☐	5132	Red Lead Paints
☐	5133	Flexible Metal Hose
☐	5134	Corrosion-proofing Service
☐	5135	Stainless Pipe
☐	5136	Protective Coatings
☐	5137	Protective Coatings
☐	5138	Corrosion-resistant Pails
☐	5139	Allyl-phenolic Linings
☐	5140	High-temperature Alloys
☐	5141	Teflon Mechanical Shaft Seal
☐	5142	Corrosion-resistant Coatings
☐	5143	Acid-resistant Packing
☐	5144	Corrosion-resistant Primer
☐	5145	Leakproof Centrifugal Pump
☐	5146	Porcelain Valves
☐	5147	Diaphragm Valve
☐	5148	Surface Preparation for Coatings
☐	5149	Plastic Pipe
☐	5150	Neoprene Sheet Lining
☐	5151	Centrifugal Pump
☐	5152a	Diaphragm Valves
☐	5152b	Rubber Chemical Equipment
☐	5153	Corrosion-resistant Lining
☐	5154	Globe and Stop Valves
☐	5155a	Plastic Fabrication
☐	5155b	Plastic Discharge Stack
☐	5156	Immersion Heater for Corrosives
☐	5157	Mechanical Seal
☐	5158	Rubber-lined Centrifugal Pump
☐	5159	Electronic Equipment
☐	5160	Laboratory Planning
☐	5161	Plastic Tester
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☐	5163	Fluid Mixing Equipment
☐	5164	Lab Pilot Kettle
☐	5165	Laboratory Homogenizers
☐	5166	Micro-bellows Pump
☐	5167	Laboratory Oven (State Requirements)
☐	5168	Twin-shell Blender
☐	5169	Ultrasonic Generator
☐	5170	Centrifuge Tubes
☐	5171	Mass Spectrometry
☐	5172	Electrical Connections
☐	5172A	Particle-size Analyzer
☐	5173	Laboratory Press
☐	5174	Manometer
☐	5175	Wet Film Applicator
☐	5176	Laboratory Shaker
☐	5177	Silicate Stone
☐	5179	Teflon Stainless Pump
☐	5180	Radiation Counter Cell
☐	5181a	Utility or Serological Bath
☐	5181b	Extraction Rack
☐	5181c	Water Still
☐	5181d	Flash Point Tester
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☐	5183	Electrophoresis Apparatus
☐	5184	Glassware Washer
☐	5185	Crusher
☐	5186	Ovens
☐	5186A	Black-reading Thermometers
☐	5187	Laboratory Reagents
☐	5188	Electrophoresis Apparatus

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FEBRUARY, 19

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√	Key	Description
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☐	5190	Pressure Gage
☐	5191	Voltmeters
☐	5192	Safety Pipet
☐	5193	Electric Heating Mantle
☐	5195	Gas Analyzer
☐	5196	Molecular Distillation Apparatus
☐	5197	Laboratory Machines
☐	5198	Industrial Gloves (State Requirement)
☐	5199a	Motor Starter
☐	5199b	Solenoid Starter
☐	5199c	Combination Starter
☐	5199d	Circuit Breaker-type Starter
☐	5200	Chemical-resistant Work Clothing
☐	5201	Safety Can
☐	5202	Safety Multiple Lockout
☐	5203	Metal Stair Treads
☐	5204	Manway
☐	5205a	Aluminum Floor Grating
☐	5205b	Contour Retainer Mesh
☐	5206	Combustible Gas Detector
☐	5207	Gas Mask Canister Indicator
☐	5208	Fire Protection
☐	5209	Internal Safety Valve
☐	5210	Radiation Detectors
☐	5211	Gas Masks
☐	5212	Pressure Control
☐	5213	Portable Audiometer
☐	5214	Static Electricity Eliminator
☐	5215	Electrical Fittings
☐	5216	Magnetic Separator
☐	5217	Emergency Lock Release
☐	5218a	Eye-wash Fountain
☐	5218b	Emergency Shower
☐	5219	Liquid-tight Gloves
☐	5220	Spray Nozzle
☐	5221	Buckets
☐	5222	Fire Extinguisher Cart
☐	5223	Plastic Barrier Rope
☐	5224a	Safety Apron & Sleeves
☐	5224b	Chemical Goggles
☐	5224c	Respirators
☐	5225	Bronze Valves
☐	5226	Explosion-proof Switch
☐	5227	Magnetic Separators
☐	5228	Porcelain Containers
☐	5229	Technical Data Books
☐	5230	Protective Clothing
☐	5231	Machine Safety Control
☐	5232	Respirator
☐	5233	Magnetic Separator
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☐	5236	Stop Valves
☐	5237	Drying Machinery
☐	5238	Heat Exchangers
☐	5239	Process Equipment Fabrication
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☐	5242	Glass-lined Pressure Reactor
☐	5243	Flaker
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☐	5245	Wet Cyclones
☐	5246	Catalyst Carriers
☐	5247	Vacuum & Pressure Filtration
☐	5248	Mixers
☐	5249	Plate Heat Exchangers
☐	5250	Rotary Drum Dryer
☐	5251	Relief Valves
☐	5252	Hot Water Heating System
☐	5253	Combination Cartridging Machine
☐	5254	Vibrating Screen Separator
☐	5255	Packaged Pilot Plants
☐	5256	Mullers
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☐	5258	Recausticizing System
☐	5259	Automatic Rapping System
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☐	5265	Ion Exchanger
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☐	5271a	Label Dispenser
☐	5271b	Self-adhesive Labels
☐	5272	Multiwall Bag Printing
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☐	5276	Lithographing Service
☐	5277	Lined Containers
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☐	5279	Check-weigher
☐	5280	Portable Bag Closer
☐	5281	Powder Filling Machine
☐	5282	Check-weight Bag Scale
☐	5283	Concrete Storage Bin
☐	5284	Valve Bag Packer & Settler
☐	5285	Cutters
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☐	5293	Direct-fired Air Heater
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☐	5295	Duct Fans
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☐	5297	Boiler Blowdown
☐	5298	Mist Eliminator
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☐	5300	Dust Collector
☐	5301	Lubricated Plug Valve
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☐	5303	Teflon Packing
☐	5304	Armored Multiple Tubing
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☐	5306	Variable-pitch Motor Pulley
☐	5307	Glass Insulation for Piping, Tanks
☐	5308	Centrifugal Pump
☐	5309	Asbestos Rope Insulation
☐	5310	Non-shrink Method of Grouting
☐	5311	Drain Valve
☐	5312	Molybdenum Disulfide Lubricant
☐	5313	Worm Reducer Assembly
☐	5314	Heat Exchanger
☐	5315	Protective Coatings
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☐	5317	Line Blinds
☐	5318	Pipe Joint Compound
☐	5319	Metal Fabrication
☐	5320	Dry Film Lubricant
☐	5321	Sunlight-resistant Plastic Pipe
☐	5322	Teflon-asbestos Packings & Gaskets
☐	5323a	Horizontal Filter
☐	5323b	Scraper Filter
☐	5323c	String Discharge Filter
☐	5324	Self-cleaning Valve
☐	5325	Tee-head Bolt
☐	5326	Variable-feed Pump
☐	5327	Industrial Vacuum Cleaning
☐	5328	Liquid Meter
☐	5329	Tube Ribbon
☐	5330	Portable Temperature Indicator
☐	5331	Mineral Rights & Real Estate
☐	5332	Line Blind Valves
☐	5333	Subminiature Thermal Switch
☐	5334	Rubber-based Masonry Coating
☐	5335	Woven Metal Cloth
☐	5336	Centrifugal Wash Collector
☐	5337	Condenser Tube Cleaner
☐	5338	Aluminum Siding
☐	5339	Gaskets, Shims, Washers
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☐	5342	Leak-proof Pump
☐	5343	Industrial Location Service
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☐	5348b	Pulverizer
☐	5348c	Mixer
☐	5348d	Blender
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☐	5360	Rotary Pumps
☐	5361	Automatic Doors
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☐	5363	Rotary Pressure Joint
☐	5364	Air Sterilization
☐	5365	Stock Valves
☐	5366	Flow Control Pumps
☐	5367	Plug Valves
☐	5368	Muffle Furnace
☐	5369	Pump for Abrasives
☐	5370	Steam Reducing Valve
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☐	5377	Teflon Gaskets
☐	5378	Gage Protector Valve
☐	5379	Liquid Density Controller
☐	5380	Filter Press
☐	5381	Cleanser
☐	5382	Lubricants
☐	5383	Threading Stainless Pipe
☐	5384a	Metering Valves
☐	5384b	Needle, Toggle, Check Valves
☐	5385	Filters
☐	5386	Vibrating Conveyor
☐	5387	High-speed Framing Camera
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☐	5389	Rubber-fabric Dip Resin
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☐	5391	Couplings
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☐	5393	Laboratory Equipment
☐	5394	High-vacuum Pump
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☐	5396	Flow Meters
☐	5397	Mica
☐	5398	A.C. Motors
☐	5399	Stainless Utensils
☐	5400	Plate-coils
☐	5401	Tank Linings
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☐	5412	Progressing-cavity Pump
☐	5413a	Portable Filter
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☐	5430	Motor-Pump
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☐	5432	Automatic Clutch Coupling
☐	5433	Drum Rings
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☐	5435	Dust Collector
☐	5436	Heavy-duty Filter
☐	5437	Occupational Safety Servic
☐	5438	Propylene Oxide
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☐	5440	Solenoid Valve
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☐	5442	Frangible Disc
☐	5443	Corrosion-resistant Fastener
☐	5444	Nickel Alloy Steel
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☐	5447	Steam Traps
☐	5448	Rotary Unions
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☐	5450	Heating Systems
☐	5451	Laboratory Equipment
☐	5452	Ethylene Glycol
☐	5453	Plastic Paint
☐	5454	Needle Valve
☐	5455	Heat Transfer Equipment
☐	5456	Drum Linings
☐	5457	Bentonite
☐	5458	Filter Fabric
☐	5459	Lubricants
☐	5460	Ball Bearing Swivel Fitting
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☐	5462	Pressure Measuring Elemen
☐	5463	Porcelain Tower Packings
☐	5464	Flexible Metal Hose
☐	5465	Copper Welding
☐	5466	Dust Filter & Collector
☐	5467	Casters & Wheels
☐	5468a	Pilot Plant Homogenizer
☐	5468b	Colloid Mill
☐	5469	Tube Fittings
☐	5470	Sifter
☐	5471a	Granulator
☐	5471b	Mixer
☐	5471c	Oven
☐	5471d	Rotary Press
☐	5472a	General Ventilation Fan
☐	5472b	Light-duty Ventilation Fan
☐	5472c	Small System Ventilation F
☐	5473	Squeeze Controller
☐	5474	Mechanical Shaft Seal
☐	5475	Electric Power Drives
☐	5476	Cellulose Filter Aid
☐	5477a	Rupture Disk
☐	5477b	Centrifugal Pump
☐	5477c	Heat Exchanger Tubing
☐	5478	Steel Unions
☐	5479	Controlled-humidity Air Conditioning
☐	5480a	Breaker
☐	5480b	Crusher
☐	5480c	Exhauster
☐	5480d	Fiberizer
☐	5480e	Granulators
☐	5480f	Attrition Mill
☐	5480g	Laboratory Mill
☐	5480h	Separator
☐	5480i	Texturizer
☐	5481	Concrete Floor Patch
☐	5482	Teflon Expansion Joints
☐	5483	Miniature Relays
☐	5484a	Laboratory Mixer
☐	5484b	Explosion-proof Lab. Mixer
☐	5484c	Top-entering Mixers, Turbine & Paddle-type
☐	5484d	Top-entering Mixers, Propeller-type
☐	5484e	Side-entering Mixers
☐	5484f	Mixing Equipment
☐	5484g	Mixing Data Sheet
☐	5484h	Portable Mixers
☐	5485	Phthalic Anhydride

Please type or print and be sure to give your title and main product of company

Name _____ Title _____

Company _____ Main Product _____

Street Address of Company _____

City _____ Zone No. _____ State _____

Fill in . . . mail to READER SERVICE DEPT., CHEMICAL PROCESSING
111 East Delaware Place, Chicago 11, Illinois

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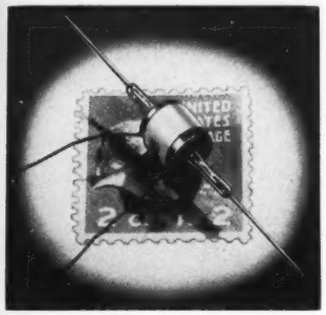
THAT'S INTERESTING

(*Continued from page 2*)

Stamp-size relay really works

Completely functional miniature relay can be actuated by solar battery or photo cell, since it requires only 18 milliwatts to effect contact closure. Stamp-size unit is designed to illustrate miniaturization possibilities of company's line of Magseal relays.



Contacts and actuating elements are made of magnetic rods sealed in glass. They differ from conventional relays in that only the contacts are sealed.

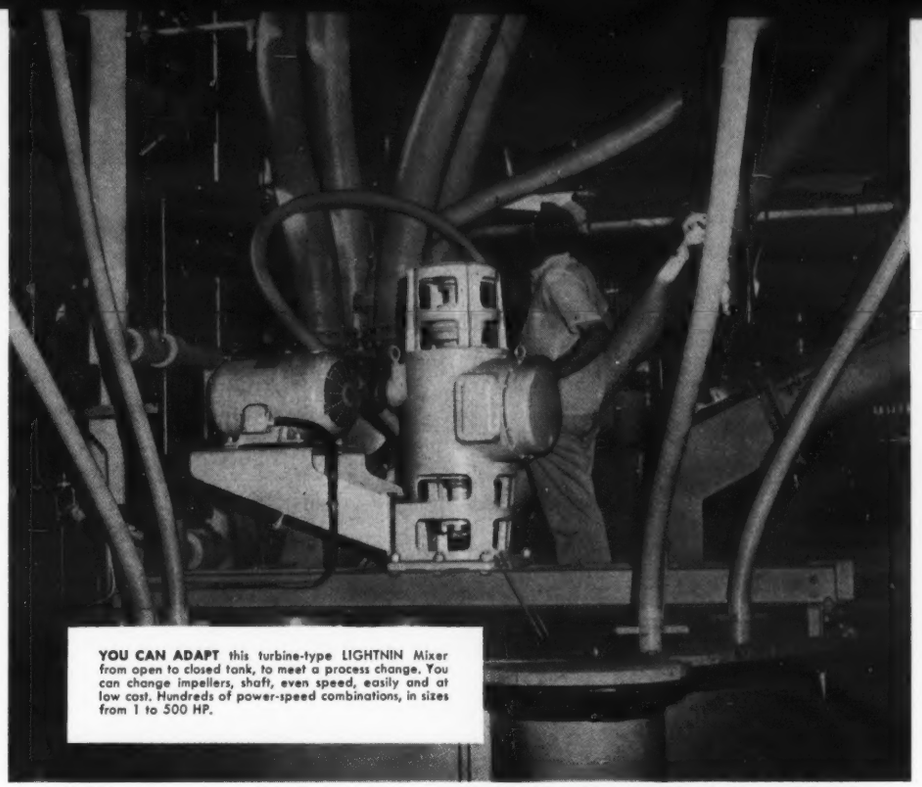
Relays are products of G. W. Giannini & Co., Dept. CP, 918 E. Green St., Pasadena 1, Calif. . . . or for more information check CP 5483 on handy form opposite last page.

How "long" are grease and leather?

This is somewhat of an academic question until one considers that both these materials are made up of minute fibers. Studies into the nature of greases have devulged that fibers contained in a spoonful of grease would reach to the moon if laid end to end. These fibers, incidentally, are what hold the oil in place in grease, keeping it from being a liquid.

Similar research on leather revealed that its internal surface is 50,000 times the outer surface. Fibers (which make for comfort) in a piece of leather one inch square would reach a mile if put end to end.

For more information on product at right, specify CP 5484 . . . see information request blank opposite last page.



YOU CAN ADAPT this turbine-type LIGHTNIN Mixer from open to closed tank, to meet a process change. You can change impellers, shaft, even speed, easily and at low cost. Hundreds of power-speed combinations, in sizes from 1 to 500 HP.

YOU CAN CHANGE quickly from a mechanical shaft seal to a packed stuffing box, and back again, with this LIGHTNIN Side Entering Mixer. This means easier maintenance . . . extra protection. Tank shutoff is out in the open—easy to get at, easy to operate. Sizes 1 to 25 HP.

YOU CAN DO HUNDREDS of mixing jobs quickly with versatile LIGHTNIN Portable Mixers. Instantly make any open tank an efficient mixing vessel. More than 30 standard models with electric or air motor, direct or gear drive. Sizes ⅛ to 3 HP.

Photo courtesy International Minerals & Chemical Corporation.

Choose a fluid mixer that grows with your process

Today, this mixer is churning up 5,000 gallons of a phosphoric acid slurry.

Tomorrow, with a few simple changes, the *same mixer* may be lifting and distributing solids throughout 3,000 gallons of heavy prefilt slurry.

Or it may be whirling millions of pin-point gas bubbles into intimate contact with 10,000 gallons of fermentation broth.

Provided the horsepower requirements are not too different, you can often switch a LIGHTNIN Mixer from one operation to another, at far less than the cost of a new mixer.

7 ways to beat obsolescence

You can change the mixer mounting from open-tank to closed pressure vessel, and vice versa. You can get a new mounting to fit any tank nozzle.

You can switch from standard to low-headroom mounting, from top entering to bottom entering.

You can change shafts—even increase or decrease shaft diameter—to meet new torque requirements.

You can change size and shape of impellers—and *know in advance* what your results will be.

And with many LIGHTNIN Mixers, you can *change speed*—quickly, simply, without dismantling the mixer or even removing it from the tank. Many of these units give you a choice of up to 16 standard interchangeable speeds.

This versatility helps you beat the high cost of obsolescence in your plant. It is just one of the reasons why LIGHTNIN is the best choice you can make for mixing fluids.

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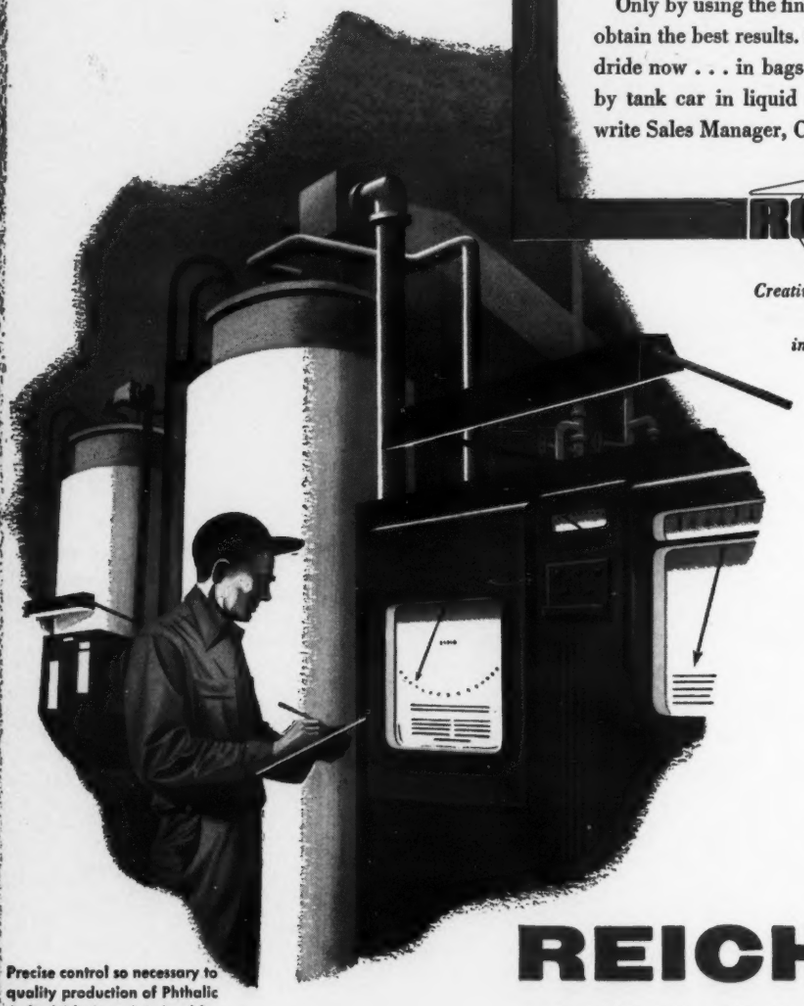

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